Designing and Implementing Corequisite Models of Developmental Education

Findings from Texas Community Colleges

Lindsay Daugherty, Celia J. Gomez, Diana Gehlhaus Carew,

Alexandra Mendoza-Graf, Trey Miller

Many students who enter community colleges are underprepared in reading, writing, and/or mathematics and designated as not being college-ready. Colleges typically require students who are not college-ready in one or more subjects to enroll in developmental education (DE), which has traditionally consisted of a series of subject-based courses for students to complete prior to entering college-level classes. Data from 2010 suggest that 68 percent of community college students enrolled in at least one DE course, at a cost of approximately $7 billion (Community College Research Center, 2014a; Scott-Clayton, Crosta, and Belfield, 2012). However, evidence indicates that traditional approaches to DE were not working for many students. One study found that only 20 percent of students assigned to traditional course-based math DE and 37 percent of students assigned to course-based reading DE completed a first college-level course within three years of entering school (Bailey, Jeong, and Cho, 2010). Faced with troubling evidence on the success of students who take traditional DE courses, states and higher education institutions across the United States are rethinking the way they address college readiness.

Key Findings

- Five common types of corequisite models were identified as being implemented in the participating Texas community colleges: paired-course models, extended instructional time models, Accelerated Learning Program models, academic support service models, and technology-mediated support models.

- Challenges to implementation included lack of stakeholder buy-in, issues with scheduling and advising, limited instructional preparation and support, and uncertainty around state policy.

- Efforts to build buy-in and address challenges were essential to successful implementation.

- Some strategies, such as dedicated time for design, professional development, and small class sizes, could be more costly.

- Unique features, such as use of a single instructor for the corequisites and mixed-ability peer groups, could be important to the effectiveness of their models but often faced more challenges with scheduling, advising, and buy-in across the institution.

A MOVEMENT TO REFORM DEVELOPMENTAL EDUCATION

In response to concerns about the effectiveness of traditional course-based DE, institutions are experimenting with a range of different reforms, including:

- *Assessment and placement reforms*: Evidence suggested that a number of students were being "misplaced," or wrongly assigned into (and out of) DE (Scott-Clayton, Crosta, and Belfield, 2012). In response, some states and institutions have reformed assessment and placement strategies. Changes included simplifying the testing process by requiring institutions to use common assessments and cut scores; using additional measures to determine placement; enhancing information on the importance of the assessment; and offering test preparation for the assessment (Barnett and Reddy, 2017; Rodriguez, 2014; Scott-Clayton, Crosta, and Belfield, 2012).

- *Acceleration of students through developmental coursework*: Historically, students scoring at the lowest levels of readiness were required to complete a sequence that ranged from two to five separate DE courses depending on institution and subject area. Research suggested that the length of DE sequences prior to college-level coursework was a primary driver of student success issues in DE (Bailey, Jeong, and Cho, 2010), and evidence suggested that reducing the length of sequences and accelerating students into college coursework more quickly was a way to improve student success (Community College Research Center, 2014b; Edgecombe, 2011). States and institutions have experimented with a range of reforms to move students through DE more quickly, including limitations on the amount of DE credits that will be funded, cutting courses from sequences, and accelerating coursework into intensive half-semester courses (Community College Research Center, 2014b; Weisburst et al., 2017). Institutions and states are also experimenting with corequisites—which require students to be placed directly into the first college-level course in a subject, while simultaneously being required to enroll in some form of DE support in that same subject (Cho et al., 2012). Some states and institutions have eliminated mandatory DE participation (Hu et al., 2017).

- *New methods of instructional delivery*: States and institutions have explored alternative ways of delivering DE support outside of the traditional classroom instruction model to improve instruction and accelerate students through DE coursework. For example, some institutions divided coursework into smaller modules and used adaptive instructional software to allow students to move through modules at different paces (Bickerstaff, Fay, and Trimble, 2016; Bonham and Boylan, 2011; Gardenhire et al., 2016). These approaches, referred to as *emporium models* and *modularization*, allowed students to move through multiple levels of DE within a single semester and receive instruction differentiated to meet a student's individual needs. States and institutions have also explored ways to better increase the use of academic support services, such as tutoring to offer instructional support for students outside of a traditional classroom setting.

- *Curriculum reform*: States and institutions have adopted changes to curricula that shift DE instructional content. For example, many have integrated reading and writing into a single course or sequence rather than offering separate course sequences in each area (Edgecombe et al., 2012). In math, reforms have focused on dividing math coursework into different "pathways." Rather than all students taking

Many practitioners support state and institutional developmental education reforms; however, some faculty and administrators have expressed concerns.

algebra, students enroll in math courses (pathways) that are more aligned with the content required for a student's major, such as statistics, contemporary math, and quantitative reasoning (Hoang et al., 2017; Zachry Rutschow and Diamond, 2015). In addition to reforming curricula, integrated reading and writing and math pathways often shorten DE sequences for students.

- *Enhanced advising and student support*: Given the many challenges DE students face navigating through college and overcoming nonacademic barriers to success, states and institutions have also explored DE reforms that enhance advising and support for students. The Accelerated Studies in Associates Program (ASAP) paired DE instructional reforms with enhanced advising and additional wraparound supports (e.g., transit subsidies) to ensure students were adequately assisted (Scrivener, Weiss, and Teres, 2009; Scrivener et al., 2015). Institutions have also explored learning communities—requiring students to enroll in several courses with a common cohort of students and the same instructor—as a means of offering greater support to students by building comfort and trust with peers and instructors (Visher et al., 2012). Another common DE reform required students to enroll in a student success course focused on building study skills and noncognitive skills (Clouse, 2012; Jamelske, 2009).

Research suggests that a number of DE reforms have been successful in improving student outcomes. For example, corequisites (Cho et al., 2012), integrated reading and writing (Edgecombe et al., 2012), enhanced advising (Visher, Butcher, and Cerna, 2010), student success courses (Clouse, 2012; Jamelske, 2009), and short DE courses (Weisburst et al., 2017) have helped to improve persistence and course outcomes. Some programs—such as the ASAP program—combine several reforms to maximize effectiveness; results for ASAP indicate that the program has nearly doubled graduation rates (Scrivener, Weiss, and Teres, 2009; Scrivener et al., 2015). On the other hand, some DE reforms have been less successful; for example, studies of learning communities and modularized math reforms found few positive impacts (Bragg, 2009; Bickerstaff, Fay, and Trimble, 2016; Gardenhire et al., 2016; Visher et al., 2012).

Many practitioners support state and institutional DE reforms; however, some faculty and administrators have expressed concerns. Critics of the reform movement argue that the reforms have been pushed through too quickly, with limited research on the effectiveness of these reforms prior to scaling. There have also been concerns about reformers pushing a one-size-fits-all approach for students of all ability levels. In addition, DE practitioners worry that they and other experts have had too limited a role in advising on and driving these changes. Reformers counter that the opposition among practitioners stems largely from organizational inertia and individual concerns about jobs for DE instructors.

A CLOSER LOOK AT COREQUISITES

As indicated above, corequisites are a popular reform strategy used to reduce the length of developmental sequences. Students in corequisites skip one or more DE courses and move directly into a college-level course in the first semester with DE support provided alongside the college-level course (Figure 1). While all corequisites are designed to accelerate students through DE sequences, some corequisites also incorporate reforms into curriculum and delivery of instruction. In addition, some institutions pair corequisites with additional advising and/or wraparound supports.

The most well-known corequisite model is the Accelerated Learning Program (ALP), developed by the Community College of Baltimore County. The ALP model required students who were not college-ready in writing to enroll simultaneously in a three credit-hour college-level writing course and a three credit-hour DE course, with the same instructor teaching both courses.[1] The model mixed ten DE students with ten college-ready students in the college course. In the DE support, the group of ten DE students received an additional three hours of support with basic writing and reading skills that were aligned with work from the college-level course. Research on the ALP model found that students who enrolled in corequisites were 36 percentage points more likely than students in traditional DE course sequences to successfully complete a college-level course within one year, and corequisite students were 6 percentage points more likely to persist into a second year of college (Cho et al., 2012).

Institutions and states across the United States are now moving to rapidly adopt and scale corequisite models. In 2017, the state of Texas and several large community college systems in other states announced major shifts in policy toward corequisite models and away from traditional DE (we describe Texas policies in greater detail in Box 2).[2] These reforms followed previous efforts to scale corequisites or other major shifts in DE delivery in such states as Tennessee, Florida, Colorado, and West Virginia. Early descriptive evidence from states scaling corequisites suggests that course-completion rates for first college-level courses have improved (Complete College America, 2016). However, rigorous research evidence on the effectiveness of corequisites is limited to the studies of the ALP model.

Many unanswered questions remain as states and institutions move to adopt and scale corequisites. Institutions have implemented new models of corequisites, including models that experiment with different intensity levels (in terms of credit hours

Figure 1. Corequisite Models Versus Traditional Developmental Education
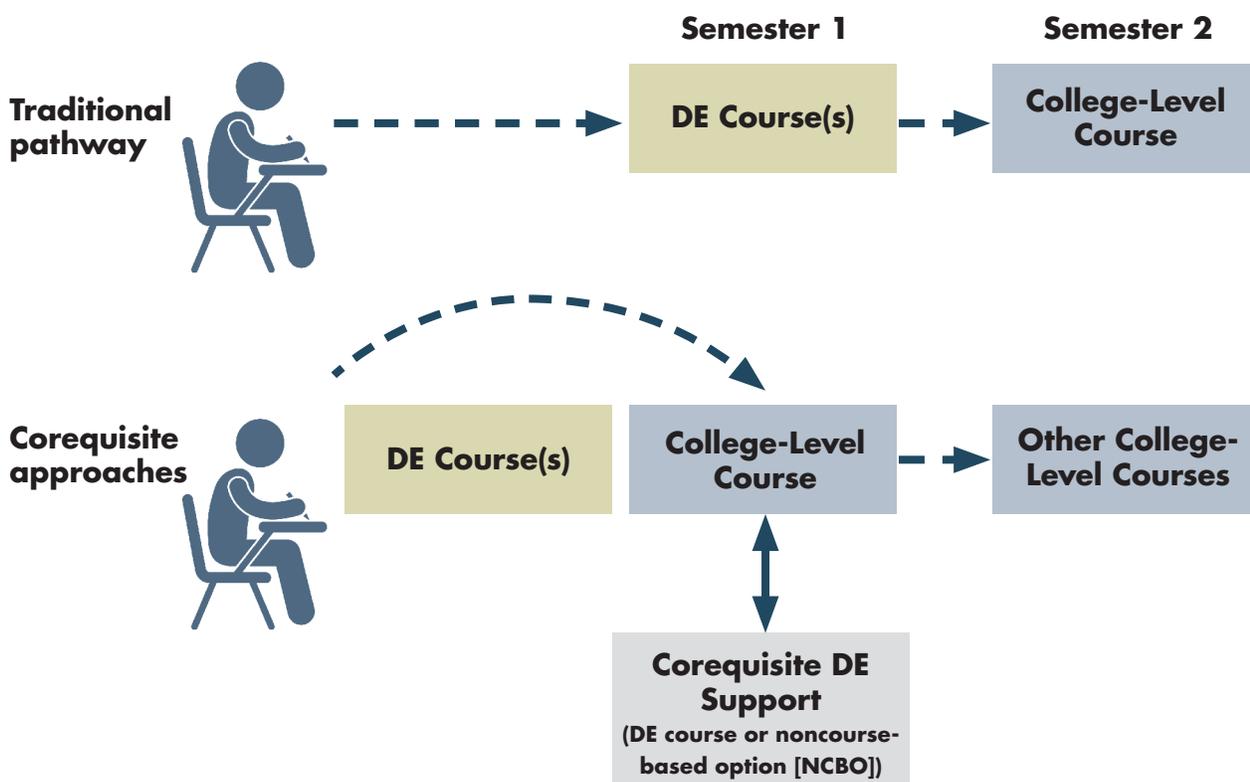
Box 1. Description of the Texas Corequisite Study

The study, funded by the U.S. Department of Education, examines corequisites that pair an integrated reading and writing DE support with a college-level English course. We are assessing corequisites implemented at Texas community colleges between fall 2016 and fall 2018, with a focus on the following research questions:

1) How are institutions across the state responding to state corequisite policies? What are the challenges to implementation? What strategies have helped to overcome challenges?
2) Are corequisites being implemented in ways that align with promising practices for DE instruction (e.g., alignment, personalization)?
3) How do student experiences in corequisites compare to student experiences in traditional DE?
4) What are the impacts of corequisites on short-run and long-run student outcomes?
5) How do the impacts of corequisites vary according across corequisite models, schools, and student subgroups?
6) What are the costs of implementing corequisites?

Our approach to studying corequisites includes two main components: a randomized control trial (RCT) that examines implementation and impact, and a statewide implementation study. The RCT study focuses on five community colleges that are implementing corequisites with one-credit-hour DE supports attached to a college-level English course, while the statewide implementation study examines all corequisites attached to a college-level English course. We are drawing from a range of data sources to inform the study (described below).

	RCT Implementation and Impact Study	**Statewide Implementation Study**
Corequisites Examined	▷ Corequisites with a one-credit-hour DE support attached to a college-level English course	▷ All corequisites attached to a college-level English course
Colleges Targeted	▷ El Paso Community College ▷ Houston Community College ▷ Lone Star College—Tomball ▷ Lone Star College—University Park ▷ Mountain View College (Dallas CCCCD)	▷ All community colleges in Texas
Data Sources	▷ Interviews/focus groups with administrators, faculty, and students ▷ Faculty survey ▷ Student baseline and follow-up survey ▷ Classroom observations ▷ Course documentation ▷ Administrative data	▷ Interviews with administrators and faculty ▷ Annual state Developmental Education Programs Survey (DEPS) ▷ Administrative data

and contact hours) and models that rely on alternative instructional approaches. However, evidence is limited on the effectiveness of corequisite models other than ALP. The early research focused on the impact of corequisites for students who were close to being college-ready, yet states and institutions have rolled out policies that target corequisites to students with lower levels of incoming college-readiness. It is unclear whether these new groups of students will benefit in the same ways as did students in earlier studies. In addition, there is little information on other student characteristics associated with success in corequisites. This information could help institutions to better target the intervention to students who would benefit most (and least), and help states and institutions understand more about the impacts of corequisites on equity. Finally, little is understood about the theory underlying corequisites and the aspects of implementation that are essential to driving positive student impacts. Understanding what makes corequisites work should help institutions to think more strategically about how to design corequisite models to increase their potential effectiveness.

To address some of these unanswered questions, RAND researchers partnered with the American Institutes for Research (AIR) and the Texas Higher Education Coordinating Board (THECB) on a study of corequisite models in Texas community colleges. An overview of the study approach is provided in Box 1. By examining the implementation and impact of a range of different corequisite models at community colleges across Texas, findings from the study will provide guidance to states and institutions that choose to adopt and scale corequisites.

This report focuses on the study's first research question (Box 1); we describe the corequisite implementation experiences of Texas community colleges in fall 2016. We start by providing background on recent DE reforms in Texas. Then, we describe the research approach used to identify findings for this report. The report provides an overview of the types of corequisites being implemented across the state, and we supplement the report with an online appendix[3] that provides more detailed findings on corequisite design and implementation decisions made by Texas community colleges. Then, we describe a range of challenges Texas community colleges faced in implementing corequisites, and discuss strategies reported by institutions as helpful in avoiding or overcoming these challenges. Finally, we conclude by reflecting on these early findings and their implications for the DE reform movement.

DEVELOPMENTAL EDUCATION REFORM IN TEXAS

Texas is among the states leading DE reform, providing an ideal context for studying the implementation and impact of corequisites. In 2011, the Texas Legislature passed Senate Bill (SB) 162, which required the THECB to develop a statewide plan for DE that encouraged the adoption and scaling of evidence-based best practices to serve underprepared college students, including corequisites. Since 2011, Texas has implemented many reforms to DE (see Box 2 for a summary of recent DE reforms). These reforms played an important role in shaping the way that corequisites were designed and implemented in Texas. In July 2017, the 85th Texas Legislature passed House Bill (HB) 2223, requiring Texas colleges to rapidly scale-up corequisites.

OUR APPROACH TO ASSESSING EARLY IMPLEMENTATION OF COREQUISITES

The aims of this early implementation report were to describe how Texas community colleges have designed and implemented corequisites, to identify challenges with implementation, and to report on strategies perceived as helpful in overcoming these challenges. We focused on the fall 2016 implementation of corequisites that attach an integrated reading and writing DE support to a college-level English course. The findings in the study draw from both of the implementation study components described in Box 1, with two primary types of data:

- *RCT implementation study data*: For the five community colleges participating in the RCT, the data collection on fall 2016 implementation was wide-ranging, including focus groups and surveys with faculty and students, interviews with administrators, and classroom observations. This report focuses on data from faculty focus groups (N=19) and administrator interviews (N=13). All data were collected between September 2016 and November 2016.

- *Statewide implementation study data*: To assess implementation at other community colleges across the state, we conducted a one-hour phone interview with the faculty and administrators most familiar with the corequisite. As part of the interview, we worked with institutions to complete a worksheet that asked for basic information on the corequisite. These interviews and worksheets were collected between April 2017 and September 2017. We restricted our statewide

Box 2. An Overview of Texas Developmental Education Policy Reforms, 2011–2017

Texas has introduced a range of reforms that relate to the implementation and impact of corequisites in Texas. Here, we provide brief descriptions of these policy reforms.

Common standards for college readiness: A policy change by the 82nd Texas Legislature (HB 1244) granted THECB the authority to establish a single set of standards for college readiness. At the time of the policy change, institutions used varying assessments and had the ability to set cut scores that differ from the college-ready standards set by the state. To achieve common standards, Texas required all public colleges to begin using a common statewide exam for placement, the Texas Success Initiative Assessment (TSIA). In 2013, the state set college-ready cut scores for placement in each subject area that all institutions were required to use; cut scores for college readiness have remained constant with the exception of the writing scores, which were lowered in 2017 based on results of a validity study (Cui and Bay, 2017). State guidance suggested that institutions identify a "bubble range" of scores below the college-ready cut score to identify students who were eligible for accelerated DE options. However, institutions had the flexibility to offer accelerated options of DE throughout the score range. The new assessment also offered a range of different diagnostic scores for students testing below college-ready, intended to inform placement and differentiate instruction and support.

Holistic advising (i.e., multiple measures): While tests can be useful in assessing student ability, studies have shown that the use of multiple measures can help to improve the accuracy of placement. Beginning in 2015, Texas required institutions to use at least one additional measure beyond TSIA scores to place DE students. Policy allowed for flexibility in which measures were used and how the measures were incorporated into placement and advising.

Noncourse-based options: NCBOs were first introduced in Texas in 2009 as a means to provide funding for DE support in reading, writing, and/or mathematics outside of the traditional classroom instruction model (e.g., mandatory attendance at the writing center, labs with modularized computer-adaptive instruction). Institutions began receiving funding for NCBOs in fall 2010, and SB 162 required that all institutions offer at least one NCBO by fall 2015. NCBOs expanded the range of innovative models of DE that institutions could implement. NCBOs also offered an opportunity for instructors to streamline and differentiate content to focus only on the learning objectives for the needs of particular students. Institutions were encouraged to use assessment scores to tailor learning objectives and coursework and to allow students to exit early once content has been mastered. NCBOs were funded at the same rate as DE courses, and the state requirements for specific NCBOs were laid out in the *Lower Division Academic Course Guide Manual* (Texas Higher Education Coordinating Board, 2016).

Corequisites (also known as mainstreaming): In 2011, SB 162 charged THECB with creating a statewide DE plan that included a range of possible approaches to acceleration. Amended rules from THECB under the Texas Success Initiative (TSI) required institutions to include a number of new DE delivery models in their course offerings, including corequisites (Texas Administrative Code, Title 19, Part 1, Chapter 4(c), Rule 4.62). State policy on corequisites required that students be coenrolled in a college course and a DE support in the same subject area and they must fall in the same semester. DE supports could be NCBOs or courses, and they could range from four to 288 contact hours per student. Institutions had substantial flexibility to design corequisites in a range of different ways and identify which populations of underprepared students were eligible for corequisites. In June 2017, the Texas governor signed HB 2223, requiring institutions to scale-up corequisite models. The law mandates a three-year progressive scale-up of participation in corequisites: 25 percent of students enrolled in DE in fall 2018 must be in corequisites, and this increases to 50 percent in fall 2019 and 75 percent in fall 2020. Some groups of students were excluded from corequisite requirements under HB 2223, including students assessed with academic skills below the ninth-grade level and students in English courses for speakers of other languages (for reading and writing only).

Instructional approaches to improve instruction or accelerate student progress: In addition to corequisites, new TSI rules drafted in response to SB 162 recommended (but did not require) that institutions adopt other reforms to DE instruction to accelerate student progress and improve the quality of instruction. These included technology-mediated instruction, modularization, and supplemental instruction.

Integration of reading and writing: In an effort to improve instruction and accelerate student progress through DE, Texas required that all public institutions integrate exit-level reading and writing DE offerings into a single course beginning in spring 2015. Requirements around integration apply to all exit-level options, including traditional DE courses and DE supports attached to college courses in corequisites. Institutions retained the option of integration at lower levels of DE. Some institutions chose to integrate throughout the sequence, while others retained separate reading and writing coursework for lower-level offerings.

Funding rules that encourage DE acceleration and reform: To encourage acceleration and other DE reforms, HB 2223 reduced the maximum number of funded contact hours from 27 hours to 18 hours per student for community colleges (although maximum credit reimbursements for students in English courses for speakers of other languages remain at 27 hours). In addition to these limits on DE credits funded, Texas has a performance-based funding system that incentivizes institutions to improve DE and move students quickly through DE by tying funding to key performance indicators, which included completion of DE and first college-level courses.

Table 1. Characteristics of Texas Community Colleges, on Average

Characteristic	All Texas Community Colleges	Colleges in Interview Sample	Colleges Interviewed
First-time in college enrollees	1,209	1,368**	1,586***
Not college-ready in reading	44.3%	45.8%	47.9%*
Not college-ready in writing	46.2%	47.5%	49.5%*
Non-white	65.4%	67.7%**	72.2%***
Economically disadvantaged	43.6%	44.8%	50.3%*
Adult learners (ages 25 and older)	12.0%	11.4%	11.2%
Number of institutions	80	60	36

NOTE: Data were drawn from first-time-in-college enrollees in fall 2016, with institution-level averages reported. Texas community colleges report as 80 separate institutions, although some institutions reporting separately belong to the same college system or district. Averages for all community colleges are compared with the 60 community colleges contacted for interviews (five RCT colleges and 55 additional colleges) and the 36 community colleges that participated in the fall 2016 implementation study (five RCT colleges and 31 additional colleges). * p<0.10 level; ** p<0.05 level; *** p<0.01 level.

interviews to institutions who appeared to have some experience with corequisites, for a total of 55 institutions.[4] Of these 55 institutions, 31 agreed to participate in an interview.

Across both study components, we report findings from 36 Texas community colleges. Table 1 examines the institution-level characteristics of community colleges in Texas, comparing statistics for the 36 participating institutions with all community colleges in Texas and the sample of 60 colleges asked to participate in the study across the RCT and statewide interview components. Institutions represented in the fall 2016 implementation data were somewhat larger than Texas community colleges on average (more fall 2016 first-time-in-college enrollees), and had a higher proportion of students designated as not college-ready. In addition, participating institutions had larger non-white populations and more economically disadvantaged students.

The majority of institutions offered only one corequisite approach attached to a college-level English course, although eight institutions offered two or more approaches. In all, institutions described 45 corequisite approaches across our 36 study institutions. Of these 45 approaches, 44 were paired with English 1301, and one was paired with Creative Writing. We now turn to describing key features across these 45 corequisite approaches.

FINDINGS: TEXAS COMMUNITY COLLEGES ARE IMPLEMENTING A RANGE OF DIFFERENT COREQUISITE MODELS

In designing and implementing corequisites, administrators and faculty at Texas community colleges had to make decisions about the structure of the corequisite, the content and pedagogy of the corequisite, and which students would be eligible to participate in corequisites. The state provided policy and guidance in certain areas, such as specifying that the DE support and college-level course must fall in the same semester and that the DE supports must integrate reading and writing. However, institutions had considerable freedom to design and implement corequisites in different ways.

Across the 36 institutions represented in the fall 2016 implementation data, we identified five common types of corequisite models being implemented. We provide a brief description of each of these five corequisite models on the following page. The online appendix to this report provides a more detailed look at many of the decisions about design and implementation made by administrators and faculty in Texas community colleges.

Figure 3 provides the distribution of corequisite models across the 36 community colleges participating in the study. Within these five general model types, we observed variation in certain

Paired course models

Institutions described paired-course models as having a DE support that looks relatively similar to the traditional DE course, although the corequisite students enrolled in the DE and college-level courses simultaneously rather than staggering the courses over two semesters. The DE supports in paired course models were structured as three- or four-credit-hour courses, and typically retained the same textbook and much of the same coursework that was used for the traditional DE course, although some interviewees described efforts to increase alignment through occasional shared coursework, aligned scheduling of course times, establishing learning communities, and shared instructors or collaborative planning. In paired course models, DE students typically enrolled in separate sections of the college-level course without college-ready students, and the course and DE support typically had student-to-instructor ratios similar to traditional courses.

Extended instructional time models

Institutions with extended instructional time models designed the DE support largely as an extension of the college-level course; in some of the most extreme cases students were unaware they were enrolled in two separate components. The DE support in extended instructional models was structured as classroom instruction, and most or all of the coursework came from the college-level course. These models often structured the DE supports as just one-credit hour, and in most cases the same instructor taught the college-level course and the support. In extended instructional time models, corequisite students typically enrolled in separate sections of the college-level course.

ALP models

As described previously, the ALP model is the most well-known corequisite model and the only model to have been studied rigorously. Institutions with ALP models adhered to the ALP-prescribed design for the most part, with the DE support structured as classroom instruction, mixed student populations in the college-level course, and reduced student-to-instructor ratios in the DE support. Guidance from ALP suggested a mix of college-level coursework and additional DE coursework, and institutions generally reported this to be the case for their ALP model corequisites, although some institutions focused to a greater degree on the college-level coursework than others. While the traditional ALP model required a three-credit-hour DE support, several colleges designed their ALP-like models to have one- or two-credit-hour supports. And while the traditional ALP model specified a mix of ten college-ready students and ten DE students in the college-level course, institutions occasionally adjusted these ratios to increase the overall course size. All institutions with ALP models used the same instructor for the college-level course and the DE support.

Academic support service models

These corequisites required mandatory, regular participation in academic support services that were commonly offered at the institutions for voluntary student use. Mandatory participation in academic support services alongside the college-level course consisted of attending the writing center (i.e., writing-based tutoring) or instructor office hours. These models were typically structured with a one-hour support, and DE students were typically integrated into sections of the college-level course with college-ready students. Office-hour–based models relied on the same instructor for both components, while writing-center–based models often used a different instructor for the DE support.

Technology-mediated support models

In technology-mediated support models, institutions required students to participate in DE supports that primarily relied on technology-mediated instruction through work on computer-adaptive modules in lab settings. These models often had one-credit-hour supports and, in most cases, a different instructor facilitated the lab sessions. Typically, these models required corequisite students to enroll in separate sections of the college-level course from college-level students.

> **Looking ahead**
>
> In future implementation study reports, we will use statewide survey data to examine implementation across all community colleges in the state. In addition, we will explore our RCT college models more deeply, describing contrasts in student experiences across and between models and the impacts of these corequisite models on student outcomes.

aspects of design and implementation; this variation is described in the online appendix to this report. Across the full sample, paired-course and extended instructional time models were the most common, accounting for 27 percent and 23 percent of models, respectively. ALP models accounted for 18 percent of models, followed by academic support service models (14 percent) and technology-mediated models (11 percent). Three community colleges had models that didn't neatly fall into one of the five model types and were classified as "other" or "combination" models.

The models in the RCT component of the study were not representative of those observed statewide. Among the corequisite models at our five RCT colleges, two were ALP models, two were academic support service models, and one was an extended instructional time model. Paired-course models were excluded from the RCT because of the study's focus on corequisites with one-credit-hour DE supports. The lack of technology-mediated models was incidental.

CHALLENGES TO COREQUISITE IMPLEMENTATION AND HOW TO OVERCOME THEM: LESSONS FOR POLICYMAKERS AND PRACTITIONERS

We spoke at length with administrators and faculty members at the 36 community colleges participating in the study about the challenges they faced in implementing corequisite models, and identified four major sets of challenges. In addition to

describing these implementation challenges, stakeholders also described a range of strategies that helped (or would have helped) to avoid or address these challenges. We have highlighted these challenges and strategies in Tables 2 and 3, respectively, and provide additional detail about each in the section that follows. These experiences provide important lessons for other states and institutions as they move to scale corequisite models. Given the richer data collected for RCT institutions, this section may draw disproportionately from the experiences of these institutions. For this reason, the challenges and strategies for overcoming challenges discussed here may be more relevant to the three models represented by the RCT schools. However, there was substantial overlap in the lessons learned reported across all 36 institutions, and we believe they apply widely to institutions implementing a range of corequisite models.

Challenge 1: Limited Buy-In Among Faculty, Advisers, and Students

Interviewees at approximately half of the participating institutions mentioned challenges related to stakeholder buy-in. Among institutions where buy-in was an issue, interviewees often reported this as the most significant challenge faced. Interviewees reported a lack of buy-in among faculty, advisers, and, occasionally, students; we did not hear about challenges with leadership buy-in at any institution.

Resistance by DE faculty was the most commonly reported issue with stakeholder buy-in. Some of the DE faculty we

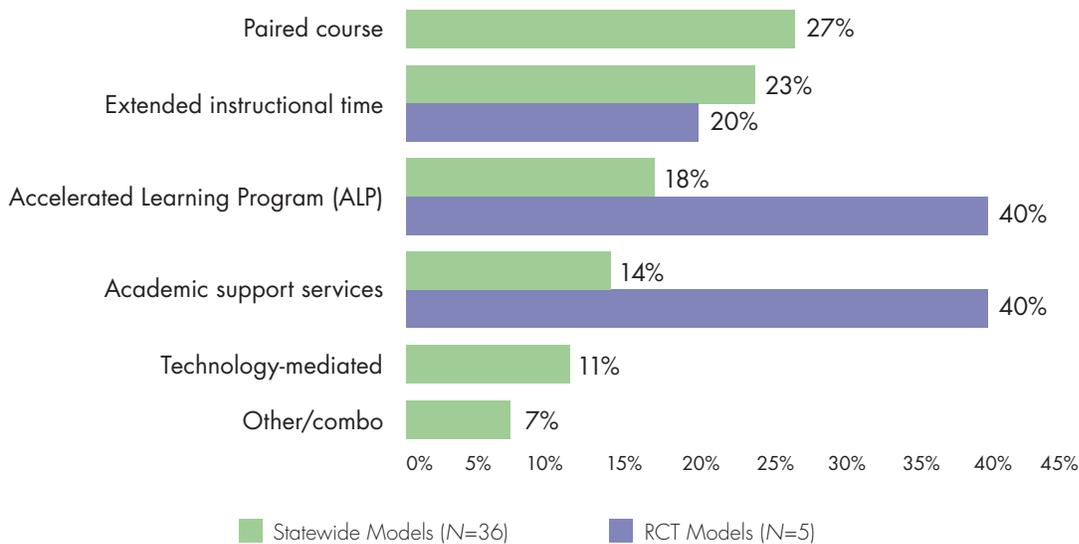**Figure 3. Distribution of Corequisite Models Across Participating Institutions**

Model	Statewide Models (N=36)	RCT Models (N=5)
Paired course	27%	
Extended instructional time	23%	20%
Accelerated Learning Program (ALP)	18%	40%
Academic support services	14%	40%
Technology-mediated	11%	
Other/combo	7%	

Table 2. Challenges Institutions Faced in Implementing Corequisite Models

CHALLENGE 1.

Limited buy-in among faculty, advisers and students

➤ Perceptions that corequisite movement devalues DE and fear of job loss among DE faculty
➤ Lack of interest among college faculty in teaching corequisites
➤ Advisers underinformed and hesitant to deviate from traditional offerings for placement
➤ Limited student interest in enrolling in corequisites, challenges with attendance

CHALLENGE 2.

Issues with scheduling and advising logistics

➤ Difficulty fitting new course structures into existing student information systems and scheduling processes
➤ Challenges balancing instructor and student course loads
➤ Limited advising capacity to support recruitment and placement into corequisites
➤ Uncertainty around state and institutional policies on assessment and advising

CHALLENGE 3.

Limited preparation and support for model design and instruction

➤ Limited materials (e.g., no textbook) to guide instruction in DE support
➤ Lack of training and professional development for instructors on corequisite instruction
➤ Limited pools of interested and qualified instructors
➤ Lesser focus on ensuring students receive instructional support in reading

CHALLENGE 4.

Rapid speed of and uncertainty around state policymaking

➤ Fatigue from rapid and broad changes to policy and guidance
➤ Limited or unclear guidance around state and institutional policies on assessment and advising
➤ Concerns about insufficient consideration of institutional perspectives in the policymaking process
➤ Lack of dedicated state funding for corequisite design and implementation

interviewed considered the corequisite movement as an incremental step toward eliminating funding for DE entirely, rather than an effort to reform the way DE is delivered. These faculty expressed concerns that the corequisite movement ignored the value of their work, and were concerned that students who were accelerated too quickly could be unprepared and be set up for failure and drop out. DE faculty who did not meet the state-mandated qualifications to teach college-level writing were particularly concerned about corequisites, expressing concerns about job stability. The recent rollout of other efforts to accelerate student progress (e.g., integrating reading and writing, cutting the number of DE credit hours reimbursed by the state) amplified these concerns regarding the elimination or devaluation of DE.

In addition to resistance from DE faculty, interviewees at a number of institutions reported limited interest in corequisite instruction among English faculty who taught college-level courses. The interviewees cited preferences among English faculty to work with college-ready students, who were likelier to have the academic, noncognitive (e.g., self-efficacy, determination), and study skills necessary to succeed. Faculty also described the job of the instructor in corequisite models as being more of a coach than a lecturer, because DE supports were often unstructured and student-centered to a greater degree than traditional courses. While some instructors noted that use of student-centered instruction was not specific to corequisites and was a growing trend in higher education, they did report it would be a major shift in instructional approaches

for some faculty who continued to rely on lecture-focused instruction. The additional effort required to design and experiment with flexible, student-centered instructional models for corequisites were reported to be deterrents for a substantial portion of instructors teaching college-level English.

Some interviewees reported challenges with buy-in among advisers. Institutions often piloted corequisites with small numbers of students, and advisers were hesitant to deviate from traditional placement options and encourage students to enroll in these specialized offerings. In addition, many institutions failed to include advisers in the planning process and provided advisers with little information on the new corequisite models prior to registration. As a result, many advisers encouraged students to enroll in the more traditional options that they were familiar with rather than the corequisite model.

We occasionally heard about students being hesitant to enroll in corequisites, and interviewees attributed this to limited marketing by advisers and/or fear of enrolling in courses that seemed different from what other students were enrolling in. These challenges may subside as corequisites are scaled and become a common pathway for students. In addition, institutions reported occasional challenges with attendance and participation in the DE support course or NCBO among students—perceived to be evidence that these students were not taking the DE support seriously. Attendance challenges were reported more often by schools where the support was less structured and students could choose when to participate.

Strategies to Address Stakeholder Buy-In

Encourage a culture of flexibility and innovation. Administrators and faculty in some institutions reported that their staff were flexible and willing to take on new challenges and pursue new strategies, and that this organizational culture was essential to facilitating the implementation of corequisites. Corequisite models in Texas often required deviations from traditional advising and instructional practices, and institutions with cultures resistant to these changes were likely to face greater challenges building stakeholder buy-in.

Garner strong support from leadership and faculty champions. Interviewees commonly mentioned leadership support as essential to successful implementation of corequisites. By signaling to faculty and staff that corequisites were a priority for the administration and something believed to be helpful to students, leaders set the tone for broader buy-in among faculty, advisers, and other staff.

Faculty champions also played an important role as leaders in the design and implementation of corequisite models and advocates who could provide information to faculty and build consensus around goals and strategies for corequisites.

Ensure faculty are credentialed to teach college-level coursework. As standalone DE courses were replaced with corequisites, opportunities for faculty without credentials to teach college-level coursework were limited. This was especially true for models that relied on a common instructor for the DE support and college-level course. Some colleges reported that all of their faculty teaching DE at the institution were credentialed to teach college-level courses, and this was perceived as helping to avoid issues with buy-in. Administrators at two institutions reported working with local four-year institutions to develop programs that would provide instructors with the graduate coursework required to teach college-level courses.

Ensure integration and collaboration across departments. Some institutions separated college-level English into different departments from DE, and some institutions had divisions (explicit or implicit) between reading and writing instructors within the DE department. Among institutions without reported challenges with faculty buy-in, several interviewees attributed this to a lack of siloes between different types of faculty. Interviewees argued that because faculty had not carved out "turf" and viewed coursework as a shared duty, the institutions were less likely to face challenges with faculty buy-in. Collaboration with other departments was also reported to be important to ensuring buy-in, as successful implementation required active engagement from faculty, advisers, and other support staff. Administrators and faculty reported that with a culture of cross-department collaboration they were more likely to share common goals and see the implementation of corequisites as a shared effort that all staff wanted to commit to.

Establish inclusive committees that meet regularly to discuss implementation. At many institutions, small committees were responsible for leading the design, implementation, and monitoring of the corequisite model, as well as informing others and building consensus. Faculty and academic departments typically led the committees responsible for design and implementation planning for corequisite models, and, in some cases, the efforts were spearheaded by just one or two instructors. Some interviewees reported regrets that they had not developed more inclusive committees that involved a wider range of faculty, advisers, IT staff, and other departments. They suggested that having other stakeholders involved in these early discussions would have

Table 3. Strategies for Overcoming Challenges to Implementation

Challenge	Strategies to Overcome Challenges
Limited buy-in among faculty, advisers, and students	► Encourage a culture of flexibility and innovation ► Garner strong support from leadership and faculty champions ► Ensure faculty are credentialed to teach college-level coursework ► Ensure integration between and collaboration across departments ► Establish inclusive committees that meet regularly to discuss implementation ► Communicate early and regularly ► Provide evidence of effectiveness
Issues with scheduling and advising logistics	► Design or adopt models that minimize complexity ► Involve advising, registrar and/or IT departments to anticipate and avoid/address issues ► Provide clear information to advisers and students on the corequisite model ► Improve state guidance on the assessment ► Adopt flexible student information and enrollment systems
Limited preparation and support for model design and instruction	► Encourage collaborative faculty ► Establish a dedicated committee and funding for model design and preparation ► Identify and/or develop large pool of qualified instructors ► Provide training and guidance on best practices ► Develop repositories of content for instructors ► Ensure sufficient facilities ► Build robust tutoring programs and writing centers ► Reduce class sizes ► Embrace continuous evaluation and improvement
Rapid speed of and uncertainty around state policymaking	► Ensure clear, consistent, and accessible policy information ► Collaborate with and solicit input from institutions ► Provide research evidence that aligns with state policy ► Identify funding to support design and implementation

helped to build buy-in and allow for faculty to receive assistance with various aspects of planning and implementation.

Communicate early and regularly. Interviewees reported that early and regular communication to a broad group of faculty, advisers, and other staff about DE reform goals and progress in developing and implementing corequisite models was important to improving buy-in. Communication was viewed as providing opportunities for engagement in the process and reducing fears about secretive policies and programs. In addition, sharing high-quality information with students about corequisites and their potential benefits was essential to ensuring that students enrolled in and stayed engaged in courses.

Provide evidence of effectiveness. Given that corequisite models required a substantial shift in how instruction was provided and exposed students with weaker skills to challenging college-level material, some interviewees had doubts about their effectiveness and concerns that rapid acceleration was harmful for students. By providing evidence that these models benefit students, some institutions were able to overcome these concerns and build stronger buy-in among faculty and advisers. Both national research and local monitoring and evaluation played important roles in providing the evidence needed to convince skeptical faculty members and advisers.

Challenge 2: Issues with Scheduling and Advising

The process of setting course schedules, assigning instructors, and enrolling students in open-enrollment institutions like community colleges was extremely complex—and, in many cases, the departments that oversaw these duties were understaffed and underresourced relative to four-year institutions. Scheduling and advising efforts began as much as eight months in advance of the start of classes and involved many different departments within an institution. Given the complexity of scheduling and tracking so many courses and students, institutions relied heavily on technology and student information systems, as well as clearly defined processes for advisers.

Institutions implementing corequisites faced unique challenges with scheduling and advising that were specific to corequisite models, as well as general challenges that institutions faced with scheduling and advising all students. Overall, this was the most commonly mentioned set of challenges; most institutions reported challenges related to scheduling and advising. However, many interviewees framed these challenges as something temporary, issues that were overcome with shifts in advising practices and technology workarounds.

Many corequisite models incorporated unique design features that presented challenges for registration systems and advisers. These included coenrollment of a cohort of students in the same course and support (i.e., learning communities), intentional mixing of college-ready students according to set ratios, and requirements that students have the same instructor for the course and support. Institutions had to find ways to link the course and DE support in registration systems, and they had to develop advising processes to ensure that students were coenrolled in both components. These special accommo-dations for scheduling and advising around corequisites often required substantial time and effort from advisers and involvement of IT specialists to build special features within student information systems.

Interviewees occasionally reported challenges balancing instructor- and student-course loads to accommodate corequisite models designed with one- or two-credit-hour corequisites, both for instructor- and for student-course loads. Full-time faculty were typically paid a fixed salary and were required to meet obligations to teach a specific number of contact hours; for adjunct instructors, there were limitations on the total number of contact hours permitted in a semester. Institutions with four- or five-credit-hour corequisite models sometimes encountered challenges balancing course loads for instructors who had traditionally taught only three-credit-hour English courses. And, for students, financial aid was closely tied to course loads; advisers worked closely with students to ensure schedules met these financial aid requirements. A few interviewees reported that corequisite models complicated efforts to achieve the necessary student-course loads.

Administrators and faculty also reported scheduling and advising challenges that were not unique to corequisite models and presented challenges for the advising of all DE students. For example, advisers had limited time with each student, and it was difficult to make time to describe all of the DE pathways when institutions offered multiple options. In addition, new corequisite policies in Texas were being implemented alongside a number of related policy changes (described in Box 2), including a new assessment and the requirement that institutions use other factors outside of the assessment for placement. Despite being two years into the implementation of the TSIA, some advisers and faculty lacked access to diagnostic scores and were

Many corequisite models encouraged greater personalization and greater alignment between the college-level and developmental education courses, while also providing substantial flexibility to instructors to determine course content and instructional approaches.

uncertain about the appropriate way to incorporate scores into placement and instruction. In addition, institutions occasionally reported concerns about the validity of the assessment and the reliability of scores for accurately conveying student ability. Institutions were also uncertain about how best to incorporate other measures into placement decisions. Challenges in understanding and implementing these related assessment and advising policy changes led to challenges determining which students should be placed into corequisite models.

Strategies to Address Scheduling and Advising Challenges

Design or adopt models that minimize complexity. Institutions that chose corequisite models with fewer unique design features encountered fewer challenges with scheduling and advising. Models with traditional class sizes and models without requirements for shared instructors, learning communities and/or mixed-ability student populations did not require the changes to technology and advising practices that more-complex models required.

Involve advising, registrar, and/or IT departments. Many interviewees reported that such involvement was critical to anticipating, avoiding, and addressing logistical challenges with advising and scheduling. Committees made up exclusively of faculty were less likely to consider the complexities of scheduling and advising related to certain corequisite models. In addition, when advisers were uninformed or under-informed about the design and implementation of corequisite models, they were ill-equipped to address questions and challenges. Lastly, early involvement may have helped to ensure that institutions had the time necessary to make changes to student registration software and advising processes.

Provide clear information to advisers and students on the corequisite model. Administrators and faculty emphasized the importance of distributing clear and consistent information to advisers and students on the corequisite options. This included information on what the model consisted of, why it was believed to be beneficial to students, and which students should be enrolled in the model. Interviewees described trainings for advisers and flyers for advisers and students that provided such information. In addition to building buy-in, this information helped to avoid confusion among advisers and to make the process of informing students about corequisites more efficient.

Improve state guidance on the assessment. While interviewees at many institutions reported that they lacked clear, accessible information on the TSIA and guidance on how to appropriately use test scores to place students in DE, some institutions did report improvements in understanding over time. Interviewees who did perceive improved guidance through institution-designed placement charts and supplementary documents found it to be useful in improving implementation of corequisites. However, many institutions continued to report a lack of clear, accessible information on the assessment and guidance on how to appropriately use test scores to place students in DE, and some suggested that improved guidance and information from the state would be helpful.

Adopt flexible student information and enrollment systems. Some administrators and faculty reported that their software was particularly inflexible in dealing with non-traditional course structures that linked sections and mixed students with varying levels of college readiness. These institutions had to find work-arounds in systems; for example, models with mixed-ability student populations required institutions to develop parallel courses within registration systems for college-ready students and DE students to ensure that sufficient numbers within each group were enrolled. According to interviewees, more flexible systems that allowed for easier mixing of students and accommodated other unique features of corequisites would have addressed many of the advising challenges.

Challenge 3: Limited Preparation and Support for Model Design and Instruction

Implementation of any new course or curriculum requires time and effort. In addition, administrators had to ensure that faculty were prepared to teach the course effectively, which consisted of purposefully selecting instructors, providing training, and ensuring the availability of supporting materials and facilities. This preparation may have been particularly important for new instructional models that were a significant departure from traditional instruction, including many of the corequisite models implemented in Texas institutions. Of the institutions interviewed for the study, many reported challenges related to the resources and preparation provided to support instruction.

Corequisite models were reported to be substantially more difficult to teach than traditional course sequences for several reasons. First, these models attempted to retain the rigor of coursework despite enrolling lesser-prepared students. And, in some cases, corequisites blended college-ready students with non-college-ready students, and faculty reported that the wider range of abilities in the classroom made instruction more

challenging. In addition, many corequisite models encouraged greater personalization and greater alignment between the college-level and DE courses, while also providing substantial flexibility to instructors to determine course content and instructional approaches. For example, DE supports often did not have a textbook or required assignments that were determined centrally, so instructors had substantial academic freedom. Supporting faculty to be effective in these more complex, flexible models underscored the importance of sufficient training and resources to support instruction. Some institutions suggested that some of their English and developmental writing and reading instructors did not have the ability to provide effective instruction in models that lacked structure and required extensive personalization. Interviewees also reported that some college instructors lacked interest in working with underprepared students.

Despite the perceived difficulty of instruction in corequisite models, interviewees at many institutions reported that the institution had initially dedicated little time or resources to planning for corequisites or to preparing faculty for instruction. Many institutions did not offer any systematic training to instructors in corequisite models, and had few instructional resources designed and offered for instructors to leverage for basic skills instruction in the DE support. Several interviewees attributed this to the quick rollout of policy by the state and a lack of state funding, while others pointed to a lack of planning within the institution.

There were also challenges specific to the integration of reading and writing support in corequisite models. Some institutions were not aware of the state mandate requiring the DE support to provide integrated reading and writing support and designed the DE supports to focus exclusively on writing. Even when institutions were aware that the corequisites needed to be integrated, corequisites were usually paired with a course that focused to a greater degree on writing (e.g., Composition, Creative Writing) or reading (e.g., History, Psychology). To the degree that DE sup-

Institutional training helped to ensure that instructors had the qualities necessary to be effective, communicated goals for the corequisite and key details on implementation, and provided ideas for instructional content.

ports paired with writing-intensive English courses had shared coursework and learning objectives, the DE supports may have placed a greater emphasis on instruction around writing. In addition, corequisites paired with college-level writing courses were often designed and taught primarily by instructors trained in writing instruction, particularly in models that required the same instructor for the college-level course and the corequisite. A few of the writing instructors with whom we spoke reported a lack of training or comfort with supporting students who struggled in reading. Together, these factors may have presented challenges to ensuring that instructors were prepared to provide students with sufficient reading support.

Strategies to Improve Instructional Preparation and Support

Encourage collaborative faculty. Some administrators and faculty we interviewed cited collaboration among faculty members as important to facilitating the design of the model and ensuring that instructors were adequately prepared and supportive. Faculty who had experience with developmental instruction provided expertise on how to work with students who come in with limited writing and reading skills, as well as potential deficits in noncognitive and study skills. Faculty teaching English 1301 and other follow-on English courses provided insights on how to maintain rigor and ensure that students were adequately prepared for later coursework. Collaboration between instructional experts in reading and writing ensured that the course was designed to effectively support development in both areas. Institutions where collaboration among faculty was not leveraged encountered limitations in terms of being able to draw from the diverse range of expertise represented among the full faculty.

Establish a dedicated committee and funding for model design and preparation. Some institutions set aside specific funding for the design and implementation of corequisites and developed a committee to oversee the process. Faculty reported that these investments in planning played an important role in facilitating implementation. Planning time helped institutions develop a clear vision for how content and instruction should look in a corequisite, even in models where this vision included substantial flexibility and academic freedom. Planning committees also helped to select faculty, provide trainings, and identify and share instructional resources.

Identify and/or develop a large pool of qualified instructors. Most interviewees reported that successful implementation of corequisite models required instructors with particular skill sets. Qualities cited as important included flexibility, willingness to experiment with new instructional models, flexibility to personalize instruction and work with wide-ranging student needs, and a passion for working with underprepared students. In the initial years of implementation, many institutions offered few corequisite sections, and could therefore afford a careful selection process resulting in qualified instructors. However, to ensure a sufficient pool of qualified instructors as institutions scale corequisite models, institutions may need to build these qualities among their current instructors (through changes in culture and training) or hire new faculty.

Provide training and guidance on best practices. While relatively few interviewees reported that their institutions provided formal training to instructors prior to launching corequisite models, those that did described it as valuable and effective. Institutional training helped to ensure that instructors had the qualities necessary to be effective, communicated goals for the corequisite and key details on implementation, and provided ideas for instructional content. In addition to local training, many institutions reported that sharing evidence on promising practices was useful in designing and implementing effective corequisite models. Administrators

and faculty cited national conferences and trainings provided by experts on the ALP model, as well as state-funded professional development meetings. In addition, many interviewees reported that structured opportunities for faculty within an institution to come together and informally share promising practices were also valuable.

Develop repositories of content for instructors. Many of the DE support courses and NCBOs implemented by Texas community colleges were unstructured relative to typical courses, without designated textbooks, assessments, or required assignments. While faculty appreciated this flexibility and often drew much content from the college-level course, they also reported that having some resources to provide additional writing and reading support was essential. In some cases, faculty leads shared their syllabi with other instructors as a model, and several institutions reported developing repositories of content that could be used to address writing and reading deficiencies.

Ensure sufficient facilities. Community colleges were often subject to constraints on their facilities, with access to lab facilities and active-learning classrooms limited. Yet many corequisite models call for instructional approaches that require students to have access to computers and/or environments conducive to active-learning approaches. In addition, some schools reported that a lack of office space prevented instructors from holding regular office hours as a means of support. Access often varied across instructors within an institution, and those with access to the appropriate facilities reported being better able to deliver effective support than were instructors who did not have access.

Build robust tutoring programs and writing centers. Some corequisite models explicitly require or encourage students to use support services from a writing center or another tutoring center. Several institutions reported that the capacity to serve corequisite students in these tutoring centers and high-quality tutoring services played an important role in facilitating implementation.

Reduce class sizes. Given the complexity of instruction in corequisite models, many interviewees cited small class sizes in the DE support and/or the college-level course as essential for ensuring that faculty could devote the necessary time and attention to aligning and personalizing content for an underprepared student population.

Embrace continuous evaluation and improvement. Many administrators and faculty members reported that it took several semesters of experimentation before settling on a corequisite model that worked with the institution's student population and ensuring that instructors were adequately supported to be effective. Opportunities for instructors to reflect on experiences and share promising practices were reported to be valuable in refining models and preparing instructors. In addition, more formal evaluation and evidence on student outcomes helped administrators and instructors to assess effectiveness and make midcourse corrections to the design or to training and support services.

Challenge 4: Rapid Speed of and Uncertainty Around State Policymaking

Texas enacted legislation that rapidly scaled-up acceleration models, while it simultaneously implemented a number of other policy changes that impact DE, including use of a new placement exam, changes to assessment cut scores, requirements that institutions use multiple measures for placement, and the integration of reading and writing developmental education (see Box 2). While some institutions reported that state policies have played an important role in encouraging institutions to develop innovative instructional models and adopt promising practices, the rapid speed of policymaking and uncertainty around policy were cited as challenges by interviewees at nearly half of the institutions participating in the study.

The state distributed information on policies related to corequisite implementation in a range of ways, including professional development meetings and conferences, webinars, listservs, and informal conversations between policymakers and institutions. However, various institutions reported that this guidance was insufficient or inconsistent, leading to confusion among stakeholders. The simultaneous rollout of several policy changes at one time made implementation particularly complex. As described previously, there was confusion around whether corequisites needed to provide support in both reading and writing, and uncertainty about how assessment scores should be used for placement. In addition, there were concerns that the rapid pace of policymaking prevented institutions from fully implementing a policy before state guidance shifted in another direction. Some interviewees indicated that they had slowed the pace of responding to state policies because of frustration about the rapid pace of policymaking and uncertainty about future policy changes.

Interviewees also expressed concerns about the process and evidence used to determine state policy and guidance. A few

interviewees suggested that state policymakers had little interest in considering institutional perspectives as they developed policy, and a few mentioned concerns about the role of outside advocacy organizations in driving legislation. Interviewees also suggested that policymakers should have waited for additional evidence on the long-term effectiveness of corequisite models before they moved to scale the intervention under 2017 legislation (Texas State House, 2017). In some cases, respondents perceived state policymaking as being implemented to undermine the efforts of DE instructors and eliminate DE to save the state money.

Finally, institutions reported that the limited funding offered to support the design and implementation of corequisites was a challenge. A few interviewees reported that the institution offered resources devoted to corequisite design and continuous improvement. However, many interviewees argued that, in terms of state funding, the requirement to scale corequisites was rolled out as an "unfunded mandate." Interviewees suggested that the lack of dedicated resources to design corequisites and provide sufficient professional development to faculty and other staff within the institutions was a challenge to successful implementation.

Strategies to Facilitate Compliance with Policy and Guidance

Ensure clear, consistent, and accessible policy information. While interviewees reported liking the flexibility that state policy provided around design and implementation of corequisites, they were eager for clear guidance when there were specific policy requirements. Interviewees varied in the degree to which they reported that guidance was clear, consistent, and accessible. In the cases where institutions were provided with clear guidance, interviewees perceived it as a facilitator. However, institutions were more likely to cite a lack of information as a barrier and expressed a desire for additional guidance from the state in certain areas.

Collaborate with and solicit input from institutions. In describing frustrations about the speed and uncertainty of policymaking, some stakeholders emphasized concerns about perceived exclusion of institutions from the process. While the state provided opportunities for institutions to testify on legislation and provide feedback on draft policies, some interviewees perceived that concerns raised by institutions were often ignored. Several institutions suggested that additional efforts to engage institutions in the policymaking process could help to improve buy-in among stakeholders, ensure that policies and

guidance are designed to be more effectively implemented, and improve understanding of state policy and guidance.

Provide research evidence that informs and/or aligns with state policy. While the existing research on corequisites is limited, several interviewees reported that research evidence on the effectiveness of the ALP model and emerging descriptive evidence from Tennessee and Florida was important in convincing stakeholders that state policy was in the interest of students. Faculty and administrators also relied on research evidence to inform them of best practices where state policy and guidance was not provided or was unclear. In addition, several interviewees suggested that current research being conducted on implementation and effectiveness would be helpful in informing future state policy and providing additional guidance to institutions.

Identify funding to support design and implementation. Mandates from the state to develop and rapidly scale-up corequisites—models of DE that were a significant departure from traditional DE delivery and instruction—required faculty and other school staff to dedicate time to designing corequisites, participating in professional development, and using continuous improvement efforts to refine the corequisite over time. Some interviewees reported that their institutions had identified resources to support design, planning, and reflection efforts for corequisites, and they suggested that this funding increased the likelihood of successful implementation. Yet some interviewees suggested that the state should have dedicated new streams of funding to support institutions with these implementation activities rather than it being the responsibility of institutions.

CONCLUDING THOUGHTS

Institutions and states are making important decisions about how to design corequisite models, which students to place into corequisites, and how to promote successful implementation. Early evidence on corequisites suggest that they offer a promising solution to reforming DE, yet there are many unanswered questions about which models are effective, how corequisites are best implemented, and who will be successful in corequisites. The experiences of Texas community colleges offer important lessons to inform these efforts.

The findings on early implementation in this report indicate that a range of corequisite models are being implemented in Texas community colleges. Future reports will provide evidence on the effectiveness of three different types of corequisite

models and unpack the mechanisms most likely to be driving student outcomes. If different types of models are found to be effective in improving student outcomes, they offer a range of design options for other institutions interested in alternatives to the ALP model. However, the variation across models being implemented in Texas also makes evaluation more challenging. Our study only examines three of the five common models being implemented in Texas, and we focus on models with one-credit-hour supports, so we will not be able to generalize findings to other types of models. It is also challenging to disentangle the effectiveness of specific model types from other aspects of institutional context that may impact the effectiveness of corequisites. However, in a state where institutions have the freedom to implement a wide range of corequisites, understanding the full scope of the variation and assessing effectiveness across a range of models is important to the representativeness of findings.

Because corequisites are a significant departure from traditional DE, many institutions encountered challenges with implementation. Institutions reported that buy-in throughout the institution and collective efforts to address these challenges were essential to successful implementation. Many of the strategies described by institutions to overcome challenges aimed to bring a broader range of individuals into the planning process and ensure that all stakeholders within the institution were informed about evidence on the effectiveness of corequisites, goals for corequisites within the institution, and details on implementation. Institutions and states should prioritize these collaboration and communication efforts as they move to scale corequisites.

Early findings also suggest that there may be trade-offs as institutions scale corequisites. Institutions argued that the unique features of some models, such as smaller class sizes and mixed-ability peer groups, were important to the effectiveness of their models. Yet, corequisites with unique design features

often faced more challenges with implementation. For example, courses that mixed college-ready and DE students presented challenges for student information systems and advising processes, and having common instructors for the college course and DE support excluded many DE instructors from participating and presented challenges with buy-in. In addition, many of the strategies institutions described as useful in overcoming challenges were costly, such as dedicated time for design, professional development, and small class sizes. However, community colleges face resource challenges, and only limited funding has been provided by the state to facilitate scaling. Institutions and states will need to consider how the corequisite models can be designed and implemented in a feasible way that allows for scaling while also retaining the mechanisms that are believed to be most impactful in driving student outcomes. Decisions on how to balance these trade-offs may vary depending on the student populations served, the timeline for implementation, and institutional context.

While the Texas corequisite study and other rigorous research studies are essential to addressing many of the questions around corequisite reforms, ongoing continuous improvement efforts by states and institutions are also essential. Future reports documenting the findings of our study will address some of the unanswered questions about corequisites, but others remain. For example, the study does not assess the impact of all models being implemented across the state of Texas, and the study is not designed to address certain questions on model design and effectiveness, such as whether having the same instructor for the college course and DE support is related to the effectiveness of the corequisite. States should enact policies that facilitate experimentation and policies that support continuous improvement through access to clear information on policy and research and opportunities to reflect on and share promising practices.

NOTES

[1] In 2016, the ALP model transitioned to an integrated reading and writing focus.

[2] City University of New York (CUNY) changes were described in a March 19, 2017, article in the *New York Times* (see Harris, 2017). Changes to California State University, Texas, and Tennessee colleges were highlighted in an August 15, 2017, article in the *Christian Science Monitor* (see Mendoza, 2017).

[3] For the online appendix, see https://www.rand.org/pubs/research_reports/RR2337.html.

[4] Some community colleges in Texas are part of the same system or district but report to the state as separate institutions. We base our counts of colleges on how the schools report to the state. To determine whether institutions had "some experience with corequisites," we analyzed administrative data from the previous academic year (fall 2015) to determine whether the institution had at least five first-time-in-college students enrolled in a college-level writing course in the first semester.

REFERENCES

Bailey, T., D. W. Jeong, and S. W. Cho, "Referral, Enrollment, and Completion in Developmental Education Sequences in Community Colleges, *Economics of Education Review*, 29, 2010, pp. 255–270.

Barnett, E. A., and V. Reddy, *College Placement Strategies: Evolving Considerations and Practices*, CCRC Working Paper No. 53, New York: Columbia University, Teachers College, Community College Research Center, 2017.

Bickerstaff, S., M. P. Fay, and M. J. Trimble, *Modularization in Developmental Mathematics in Two States: Implementation and Early Outcomes*, CCRC Working Paper No. 87, New York: Columbia University, Teachers College, Community College Research Center, 2016.

Bonham, B. S., and H. R. Boylan, "Developmental Mathematics: Challenges, Promising Practices, and Recent Initiatives," *Journal of Developmental Education*, Vol. 34, No. 3, 2011, p. 2.

Bragg, D., *Community College of Denver Breaking Through Outcomes Report*, Denver, Colo.: Community College of Denver, 2009. As of January 29, 2018:
http://www.cfder.org/uploads/3/0/4/9/3049955/accelerated_english_reading_and_math_courses_at_denver_comm._college.pdf

Cho, S. W., E. Kopko, D. Jenkins, and S. S. Jaggars, *New Evidence of Success of Community College Remedial English Students: Tracking the Outcomes of Students in the Accelerated Learning Program (ALP)*, CCRC Working Paper No. 53, New York: Columbia University, Teachers College, Community College Research Center, 2012.

Clouse, W. A., *The Effects of Non-Compulsory Freshman Seminar and Core Curriculum Completion Ratios on Post-Secondary Persistence and Baccalaureate Degree Attainment*, doctoral dissertation, Colorado Springs, Colo.: University of Colorado, 2012.

Community College Research Center, *What We Know About Developmental Education Outcomes*, New York: Columbia University, Teachers College, 2014a.

Community College Research Center, *What We Know About Accelerated Developmental Education*, New York: Columbia University, Teachers College, 2014b.

Complete College America, *Corequisite Remediation: Spanning the Completion Divide*, 2016. As of January 29, 2018:
http://completecollege.org/spanningthedivide/

Cui, W. and L. Bay, *The Predictive Placement Validity Study of the Texas Success Initiative Assessment (TSIA)*, College Board, last updated June 2017. As of January 29, 2018:
http://www.thecb.state.tx.us/reports/PDF/9567.PDF?CFID=73168608&CFTOKEN=83257392

Edgecombe, N., *Accelerating the Academic Achievement of Students Referred to Developmental Education*, CCRC Working Paper No. 30, Assessment of Evidence Series, New York: Columbia University, Teachers College, Community College Research Center, 2011.

Edgecombe, N., D. Xu, M. Barragan, and S. S. Jaggars, *Analysis of Chabot College's Accelerated Developmental English Course*, New York: Columbia University, Teachers College, Community College Research Center, 2012.

Gardenhire, A., J. Diamond, C. Headlam, and M. J. Weiss, *At Their Own Pace: Interim Findings from an Evaluation of a Computer-Assisted, Modular Approach to Developmental Math*, New York: MDRC, 2016.

Harris, E., "CUNY to Revamp Remedial Programs, Hoping to Lift Graduation Rates," *New York Times*, March 19, 2017. As of January 3, 2018:
https://www.nytimes.com/2017/03/19/nyregion/cuny-remedial-programs.html

Hoang, H., M. Huang, B. Sulcer, S. Yesilyurt, *Carnegie Math Pathways 2015-2016, Impact Report: A Five-Year Review*, Stanford, Calif.: Carnegie Foundation for the Advancement of Teaching, 2017.

Hu, S., T. Bertrand Jones, R. L. Brower, T. Park, A. Nix, S. Rahming, J. Harrison, J. Sermon, and H. Daniels, *Changes on the Ground: Site Visit Report of the Third Year of Developmental Education Reform in the Florida College System*, Tallahassee, Fla.: Center for Postsecondary Success, 2017.

Jamelske, E., "Measuring the Impact of a University First-Year Experience Program on Student GPA and Retention," *Higher Education*, Vol. 57, No. 3, 2009, pp. 373–391.

Mendoza, J., "Colleges Ponder: Are Remedial Classes the Best Way to Help?" *Christian Science Monitor*, August 15, 2017. As of January 3, 2018: https://www.csmonitor.com/EqualEd/2017/0815/Colleges-ponder-Are-remedial-classes-the-best-way-to-help

Rodriguez, R., *Increasing Access to College-Level Math: Early Outcomes Using the Virginia Placement Test*, Research Brief No. 58, New York: Columbia University, Teachers College, Community College Research Center, 2014.

Scott-Clayton, J., *Do High-Stakes Placement Exams Predict College Success?* CCRC Working Paper No. 41, New York: Columbia University, Teachers College, Community College Research Center, 2012.

Scott-Clayton, J. P. M. Crosta, and C. R. Belfield, *Improving the Targeting of Treatment Evidence From College Remediation*, NBER Working Paper No. 18457, New York: Columbia University, Teachers College, Community College Research Center, 2012. As of January 29, 2018:
http://www.nber.org/papers/w18457

Scrivener, S., M. J. Weiss, A. Ratledge, T. Rudd, C. Sommo, and H. Fresques, *Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students*, New York: MDRC, 2015.

Scrivener, S., M. J. Weiss, and J. J. Teres, *More Guidance, Better Results? Three-Year Effects of an Enhanced Student Services Program at Two Community Colleges*, New York: MDRC, 2009.

Texas Higher Education Coordinating Board, *Lower Division Academic Course Guide Manual*, Austin, Texas, 2016. As of January 31, 2018:
http://www.thecb.state.tx.us/reports/pdf/7341.pdf?CFID=73168608&CFTOKEN=83257392

Texas State House, Assessment of Student Readiness Under the Texas Success Initiative, House Bill 1244, 2011. As of January 24, 2018: http://www.thecb.state.tx.us/files/dmfile/LegislativeSummaryReport82ndFINALRevised729.pdf

Texas State House, Relating to Developmental Coursework Offered by Public Institutions of Higher Education Under the Texas Success Initiative, House Bill 2223, 2017. As of January 24, 2018: https://legiscan.com/TX/bill/HB2223/2017

Texas State Senate, Relating to Developing a Developmental Education Plan for Students Entering Public Institutions of Higher Education, Senate Bill 162, 2011. As of January 24, 2018: https://legiscan.com/TX/text/SB162/id/241199

Visher, M. G., K. F. Butcher, and O. S. Cerna, *Guiding Math Students to Campus Math Services*, New York: MDRC, 2010. As of January 29, 2018:
https://www.mdrc.org/sites/default/files/full_382.pdf

Visher, M. G., M. J. Weiss, E. Weissman, T. Rudd, and H. D. Wathington, *The Effects of Learning Communities for Students in Developmental Education: A Synthesis of Findings from Six Community Colleges*, New York: MDRC, 2012.

Weisburst, E., L. Daugherty, P. Martorell, and T. Miller, "Innovative Pathways Through Developmental Education and Post-Secondary Success: An Examination of Developmental Math Interventions Across Texas," *Journal of Higher Education*, Vol. 88, No. 2, 2017.

Zachry Rutschow, E., and J. Diamond, *Laying the Foundations: Early Findings from the New Mathways Project*, New York: MDRC, 2015.

About This Report

Many students who enter community colleges are underprepared in reading, writing, and/or mathematics and designated as not being college-ready. Colleges typically require students who are not college-ready in one or more subjects to enroll in developmental education (DE), which has traditionally consisted of subject-based courses for students to complete prior to entering college-level courses. However, evidence indicates that traditional approaches to DE were not working for many students. In response to this troubling evidence, states and higher education institutions across the United States are rethinking the way they address college readiness. This report describes how Texas community colleges have designed and implemented corequisites—a reform to DE that accelerates students into college-level courses while providing support in the same semester—and identifies challenges with implementation, and reports on strategies perceived as helpful in overcoming these challenges.

This study was undertaken by RAND Education, American Institutes for Research (AIR), and Texas Higher Education Coordinating Board (THECB). RAND Education is a unit of the RAND Corporation that conducts research on prekindergarten, kindergarten–12th grade, and higher education issues such as assessment and accountability, choice-based and standards based school reform, vocational training, and the value of arts education and policy in sustaining and promoting well-rounded communities.

More information about RAND can be found at www.rand.org. Questions about this report should be directed to Lindsay Daugherty at ldaugher@rand.org, and questions about RAND Education should be directed to education@rand.org.

About the Authors

Lindsay Daugherty is a full policy researcher at RAND who specializes in education and workforce research. Her recent areas of focus include postsecondary access and success, STEM education, policies to address unmet workforce needs, school leadership, educational technology, and programs serving veterans.

Celia J. Gomez is an associate policy researcher at RAND who specializes in the development, implementation, and evaluation of interventions and public policies that promote the well-being of children and families.

Diana Gehlhaus Carew is an assistant policy researcher at RAND and a doctoral fellow at the Pardee RAND Graduate School. Her research areas include higher education and workforce development.

Alexandra Mendoza-Graf is an assistant policy analyst at RAND and a doctoral student at the Pardee RAND Graduate School.

Trey Miller is a former economist at RAND and is currently at American Institutes for Research.

www.rand.org