

**Exploring Corequisite Developmental Education Models in the Lone Star State:
A First Report on Student Success and Corequisite Implementation**

Toby J Park-Gaghan
Christine Mokher
Hollie Daniels
Kiara McCoy
Holly Henning
Alex Moran



Florida State University

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A210319 to Florida State University. The opinions expressed are those of the authors and do not necessarily represent views of the Institute or the U.S. Department of Education.

The conclusions of this research do not necessarily reflect the opinions or official position of the Texas Education Agency, the Texas Higher Education Coordinating Board, the Texas Workforce Commission, or the State of Texas.

For more information about this study, please contact Dr. Toby J Park-Gaghan via tjpark@fsu.edu.

Executive Summary

A growing number of institutions and state systems of higher education are embracing corequisite developmental education (DE) models whereby students take developmental (or remedial) courses in the same semester as the associated introductory college-level English or math course. This model abandons the traditional notion that students must complete all DE courses before taking college-level courses and a growing number of studies have found that corequisite models have been associated with large gains of 10 percentage points or more in the likelihood of successfully completing gateway courses in math or English in the first year relative to traditional DE models (Cho et al., 2012; Logue et al., 2019; Denley, 2015; Miller et al., 2020; Ran & Lin, 2019).

Following the implementation of state-wide corequisite DE reform across Texas, our previous research has demonstrated that more students are taking and passing college-level English and math courses now that corequisite courses are the required method of DE instruction. Further, we found that the acceleration effect was the greatest for Black and Hispanic community college students (Park-Gaghan & Mokher, 2021). Now, we seek to probe deeper into the corequisite courses themselves to see what might be driving this increase in student success. In particular, Texas permits individual institutions to decide how to offer corequisite course option in terms of both structure and intensity. In terms of structure, institutions can decide to offer the course concurrently or paired with the associated introductory college-level course, sequentially where students complete the DE portion before the college-level portion (but both within the same semester), or via a non-course competency based option (NCBO) that can take on the form of lab hours, tutoring, or other formats. In terms of intensity, institutions can also decide how many credits the courses bear, ranging from 0 to more than 4 credit hours.

In this report, we present findings from a year-long study that investigated (1) how student success in integrated reading and writing (IRW)/English and math is related to the structure and intensity of corequisite course options and (2) the decisions institutional leaders and instructors made when deciding which options to offer. Our main findings include:

Student Success in IRW/English

- Students enrolled in sequential courses tended to be more likely to pass the IRW course (77.71%) compared to students in concurrent (69.22%) and NCBO courses (57.67%).
- The likelihood of passing the IRW course was similar for all students regardless of the number of credits of the IRW course
- Students who enrolled in a 1-credit corequisite were more likely to pass gateway English relative to students enrolled in a 3-credit corequisite (74.02% versus 66.34%).
- Students taking IRW NCBOs who were in the top Texas Success Initiative Assessment (TSIA) quartile earned, on average, 2.127 fewer credits in their first year, compared to similar students enrolled in concurrent IRW DE courses.
- Students enrolled in 1-credit corequisites tended to earn 1.706 credits more in the first year relative to those enrolled in 3-credit corequisites.

Student Success in Math

- The likelihood of passing DE math was the greatest for students in sequential corequisites, with a predicted probability of passing DE math of 82.10% for sequential corequisites relative to 63.29% for NCBOs and 62.03% for concurrent corequisites.
- There are few differences in the likelihood of passing a gateway math course by corequisite structure or intensity.
- Students enrolled in DE math NCBO earned, on average, 1.833 fewer credits in the first year relative to similar students in a concurrent DE math course.
- Students enrolled in less than 1-hour DE math corequisites tended to earn 2.221 more credits in the first year relative to students enrolled in longer corequisites of 2, 3, or 4-credit hours.

Institutional Offerings, Strengths, and Challenges

- All of the institutions in our study offered in-person 3 credit IRW corequisite courses taught concurrently, paired with college-level English, with a few schools offering hybrid and online options.
- Some institutions reserved IRW NCBOs for students with lower TSIA scores, while others offered NCBOs to students with TSIA scores that were nearly college-ready.
- Colleges provided multiple math pathways and corequisite options dependent upon major, with all concurrent options set at 3 credit hours. All institutions offered face-to-face and online versions of these courses, and only one school did not provide a hybrid option.
- Many schools formed committees or advisory groups to make decisions on how to implement corequisite options. Institutions continued ongoing meetings throughout the scale-up to 100 percent corequisite offerings.
- Institutions considered student preferences and TSIA scores mapped onto advising “flowcharts” to determine placement into corequisites, as well as which structure and delivery method would be best. The most cited benefits of corequisites were students’ ability to earn college-level credit while receiving frequent, just-in-time support, in addition to the ability to directly apply skills to the content in their college-level courses.
- Frequently reported challenges of corequisites included the fact that students do not have to pass corequisites and the considerable time commitment required when completing corequisites alongside college-level courses. An additional concern about IRW included the lack of emphasis on reading comprehension.

Section I

Study Overview

Students who are underprepared for college-level work have presented a significant challenge to open-access colleges in terms of identifying the most effective ways to provide support. Postsecondary institutions have traditionally assigned these students to one or more semesters of DE courses in math, reading, and/or writing, but most students never pass or attempt subsequent college-level math or English courses (Clotfelter et al., 2015; Scott-Clayton & Rodriguez, 2015). To remedy this trend, colleges are adopting an increasingly popular policy through corequisite reform that abandons the sequential nature of DE courses. This means that underprepared students can enroll directly in the college-level course in the same term as a corequisite DE course that provides targeted support. The formats offered for corequisites include course-based options consisting of mandatory companion classes, or non-course-based options such as extra lab sessions, or other required learning supports (Edgecombe, 2011). Corequisite DE carries benefits from structural and instructional changes: it reduces the number of potential exit points relative to traditional DE sequences, and it increases alignment between the content of DE and college-level course (Jaggars et al., 2015; Ran & Lin, 2019).

A growing research base shows that corequisite models have been associated with ten or more percentage point gains when compared to traditional developmental models in the likelihood of students successfully completing first-year college-level math or English (Cho et al., 2012; Denley, 2015; Logue et al., 2019; Miller et al., 2020; Ran & Lin, 2019). Further, cost-effectiveness evidence from Tennessee suggests that the corequisite model reduces the average cost per successful student of 50% for math and 11% for writing compared to traditional developmental education (Belfield et al., 2016). Given the promising evidence surrounding the effectiveness of corequisite models, educational leaders need more information about how to best implement these models to support student success. Specifically, there is a need for an exploration of the relationship between institution-level decisions about the structure and intensity of corequisite courses and student outcomes.

Further, research is also needed to examine how these relationships between different types of corequisite implementation and postsecondary outcomes interact with prior academic preparation. Lower-performing students may need a greater course intensity to master the competencies needed for college-level work. A prior study by Boatman and Long (2018) found differences in the effects of developmental education depending on the number of levels of developmental education assigned. While there were negative effects on credit earned for students assigned to only one developmental course, students who were assigned to the lowest level of developmental education experienced small positive effects for the outcomes of persistence and degree completion. These findings suggest that a one-size-fits-all approach may not work for developmental education, as some students may have a greater need for additional skill review than others depending on their incoming level of preparation. Expanded research on corequisite models can inform decisions by education agencies and institutions about corequisite implementation, as well as how these decisions may best support a diverse group of students.

Overview of Texas' Reform

Texas is the first state to mandate corequisites as the primary model of developmental education at all public institutions, providing an ideal context for examining institutional decisions regarding implementation. In 2009, Texas experimented with NCBOs (e.g., mandatory participation in computer-assisted instruction, required hours in a writing center or computer lab) to support underprepared students in reading, writing, and/or math outside of a traditional classroom setting. The 2011 passage of Texas Senate Bill (SB) 162 charged the Texas Higher Education Coordinating Board (THECB) with developing a statewide plan to move students into college-level courses faster. In response, a small number of institutions in Texas began offering either a concurrent developmental course alongside a college-level course or a developmental course through an NCBO. The passage of House Bill (HB) 2223 in 2017 required a gradual scale-up of corequisite developmental instruction from fall 2018 to fall 2021 for students who did not demonstrate college readiness on the TSIA. While some students may be exempt from the corequisites and allowed to enroll in a standalone developmental course or intervention based upon predetermined criteria (THECB, 2018), the legislation required 100% of non-exempt students in developmental education to receive corequisite instruction by fall 2021.¹

HB 2223 provided wide latitude to institutions for how they could implement corequisite options, providing a unique opportunity to explore further the conditions that may best support student success. Three dimensions where implementation may vary across institutions are the intensity, delivery method, and structure of the corequisite component. Course intensity may vary from fewer than 1 credit hour to 4 credit hours. Allowable delivery methods include face-to-face, hybrid, or a/synchronous online courses. Additionally, colleges are allowed to implement corequisites through one of three possible structures: (1) concurrent/paired course model - students co-enroll in a college-level course and linked developmental course simultaneously, (2) sequential course model - students enroll in a developmental course followed by enrollment in an accelerated college-level course in the same semester, and (3) group or self-paced NCBO - students participate in a non-course competency-based option such as independent instruction, tutoring, or supplemental instruction. These three types of structures are visually depicted in Figure 1, below.

¹ While HB 2223 affects most underprepared students in the state, certain student groups are exempt from the corequisite requirement including the lowest-performing students in adult basic education programs, and, for students in DE reading and writing, those classified as ESOL upon college entry (Texas HB 2223).

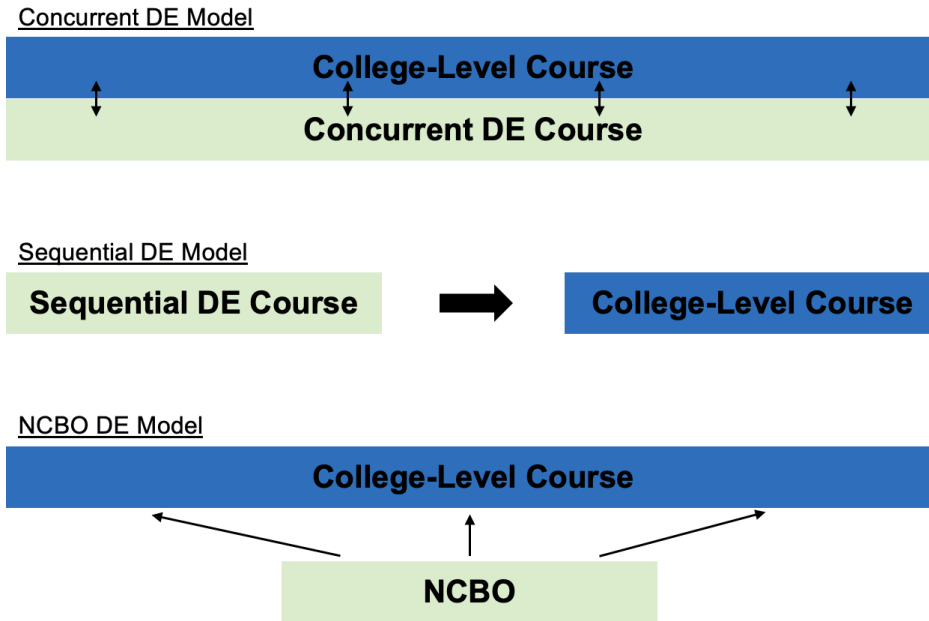


Figure 1. Different structures of corequisite DE courses

This Report

This report provides the findings from a mixed-methods evaluation of the scale-up and full implementation of Texas’ corequisite reform. Our mixed-methods approach was designed to provide a more detailed understanding of the relationship between the different corequisite DE models and student outcomes in college. Further, it is intended to uncover whether this relationship varies by students’ academic preparation (Creswell & Clark, 2011). Therefore, we conducted our qualitative and quantitative analyses simultaneously, and this report integrates the findings in order to fully understand variation in student outcomes across the different corequisite DE models (Morse, 2003). The following research questions guided our investigation:

1. What is the relationship between corequisite DE course structure/intensity and short-term student outcomes? (RQ1)
2. To what extent do these relationships differ based on students’ academic preparation? (RQ2)
3. How do corequisite developmental offerings differ among schools, in terms of structure, intensity, and delivery method? (RQ3)
4. What do stakeholders perceive as the strengths and challenges of different corequisite developmental offerings? (RQ4)
5. What are the promising practices and additional resources needed when implementing corequisite developmental offerings? (RQ5)

We begin by presenting the findings from our quantitative analyses designed to answer RQ1 and RQ2. We then present the findings from our qualitative analyses designed to answer RQ3, RQ4,

and RQ5. We conclude with an overall discussion of the two sets of findings, implications for policy and practice, and directions for future research.

Section II

Quantitative Analyses

In this section, we present our findings from the quantitative analyses exploring the relationship between the different corequisite DE models and student outcomes during the first year of college. We begin by describing our data and sample, we then present a descriptive portrait of our data, followed by a description of our analytic methods, which consists of a series of first- and second-differenced regression equations. Next, we present our findings overall and by level of academic preparation through a series of tables and figures.

Data & Sample

Our data came from student-level records collected by THECB and made available through the University of Texas at Dallas Education Research Center (ERC). These records contain student-level demographic characteristics, academic preparation, and college course taking/passing records. We included three cohorts of first-time-in-college (FTIC) students (i.e., entering cohorts in the fall terms of 2018, 2019, and 2020) who enrolled in a corequisite course in the fall semester of their first year, and examined college-level course outcomes over their first year in college. More specifically, the examined outcomes included a set of dichotomous indicators for whether students: (1) completed DE math and IRW/English coursework, and (2) passed the first college-level math and English course. We also examined the number of college-level credits students completed by the end of their first year.

Descriptive Portrait

We begin by using descriptive statistics to explore student outcomes across the state, focusing on passing rates in corequisite DE, enrollment in gateway courses, and passing rates of those gateway courses. We also examine the compositional nature of the sample in terms of race/ethnicity (indicators for Black, Hispanic, White, and “Other” racial/ethnic groups), economic disadvantage (a dichotomous indicator collected by the THECB), and sex. Further, because prior academic preparation is a contributing factor to both placement into corequisite courses and overall student success, we disaggregate our descriptive statistics by quartiles of the common placement test, the TSIA. Table 1 provides descriptive statistics on student demographics, both overall and disaggregated by TSIA Quartile (computed and displayed separately for IRW/English and math).

Table 1*Student Demographics by TSIA Quartile*

	Integrated Reading and Writing					Math				
	Overall	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Overall	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Black n	8,175	2,904	1,581	2,245	1,445	9,012	3,370	1,889	2,183	1,570
Black %	(17.8%)	(18.8%)	(20.8%)	(17.0%)	(14.9%)	(16.2%)	(18.5%)	(18.0%)	(14.6%)	(13.0%)
Hispanic n	26,690	9,490	4,259	7,705	5,236	27,815	9,892	5,300	6,987	5,636
Hispanic %	(58.0%)	(61.4%)	(55.9%)	(58.4%)	(53.9%)	(49.9%)	(54.2%)	(50.6%)	(46.8%)	(46.7%)
White n	7,099	1,601	1,064	2,212	2,222	14,837	3,607	2,681	4,684	3,865
White %	(15.4%)	(10.4%)	(14.0%)	(16.8%)	(22.9%)	(26.6%)	(19.8%)	(25.6%)	(31.4%)	(32.0%)
Other n	4,017	1,466	711	1,030	810	4,059	1,380	606	1,084	989
Other %	(8.7%)	(9.5%)	(9.3%)	(7.8%)	(8.3%)	(7.3%)	(7.6%)	(5.8%)	(7.3%)	(8.2%)
Economically Disadvantaged n	20,279	6,346	3,787	5,998	4,148	18,743	6,048	4,419	4,945	3,331
Economically Disadvantaged %	(44.1%)	(41.0%)	(49.7%)	45.46%	(42.7%)	(33.6%)	(33.1%)	(42.2%)	(33.1)	(27.6%)
Male n	17,839	6,212	2,732	4,801	4,094	21,919	7,142	3,888	5,894	4,995
Male %	(38.8%)	(40.2%)	(35.9%)	(36.4%)	(42.1%)	(39.3%)	(39.1%)	(37.1%)	(39.5%)	(41.4%)
Total n	45,981	15,461	7,615	13,192	9,713	55,723	18,249	10,476	14,938	12,060

For IRW, our total sample contained 45,981 FTIC students who took a corequisite IRW course in their first term in college. Hispanic students made up 58.0% of the sample, with Black, White, and students of another race/ethnicity making up 17.8%, 15.4%, and 8.7% of the sample, respectively. Males made up 38.8% of the sample, while students from an economically disadvantaged background made up 44.1%. In disaggregating these demographics by TSIA quartile, we note that the higher quartiles tend to contain more White students, fewer economically disadvantaged students, and roughly the same share of male students.

For math, our total sample contained 55,723 FTIC students who took a corequisite math course in their first term in college. Hispanic students made up 49.9% of the sample, with Black, White, and students of another race/ethnicity making up 18.5%, 19.8%, and 7.6% of the sample, respectively. Males made up 39.3% of the sample, while students from an economically disadvantaged background made up 33.6%. In disaggregating these demographics by TSIA quartile, we note, similarly to IRW, that the higher quartiles tend to contain more White students, fewer economically disadvantaged students, and roughly the same share of male students.

We explored the relationship between corequisite course enrollment and student success along two dimensions of corequisite course design: structure and intensity. Table 2 presents the breakdown, by TSIA quartile, for corequisite course structure (sequential, NCBO, or concurrent). In terms of structure, concurrent models were the most popular in both IRW (74.2%) and math (65.1%). NCBOs were the second most popular, comprising 20.9% and 31.4% of IRW and math courses, respectively, and sequential models were the least popular, comprising only 4.9% of IRW courses and 3.4% of math courses. For the most part, these percentages also remained consistent across TSIA quartiles in both subjects.

Table 2

Corequisite Course Structure by TSIA Quartile

Integrated Reading and Writing					
	Overall	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Sequential n	2,273	672	327	648	626
Sequential %	(4.9%)	(4.3%)	(4.3%)	(4.9%)	(6.4%)
NCBO n	9,601	3,338	1,702	2,607	1,954
NCBO %	(20.9%)	(21.6%)	(22.4%)	(19.8%)	(20.1%)
Concurrent n	34,107	11,451	5,586	9,937	7,133
Concurrent %	(74.2%)	(74.1%)	(73.4%)	(75.3%)	(73.4%)
Math					
	Overall	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Sequential n	1,907	590	374	558	385
Sequential %	(3.4%)	(3.2%)	(3.6%)	(3.7%)	(3.2%)
NCBO n	17,518	6,390	2,829	4,202	4,097
NCBO %	(31.4%)	(35.0%)	(27.0%)	(28.1%)	(34.0%)
Concurrent n	36,298	11,269	7,273	10,178	7,578
Concurrent %	(65.1%)	(61.8%)	(69.4%)	(68.1%)	(62.8%)

Table 3 presents the breakdown by corequisite intensity (less than 1 credit, 1 credit, 2 credits, 3 credits, or 4+ credits). The most common option was 3-credit courses, which comprised just over half of corequisite enrollments in both IRW (58.4%) and math (51.7%). The next most common option was 1-credit courses, which made up 25.2% of enrollments in IRW and 20.7% of enrollments in reading. Few students (about 5% or less) enrolled in corequisites that were less than 1 credit or more than 3 credits. There were some differences by TSIA quartile, with higher performing students typically taking a lower course intensity. For example, in IRW the highest performing students in quartile 4 were more likely to take a 1-credit course compared to students in quartile 1 (27.6% versus 20.4%), and less likely to take a 3-credit course (53.3% for quartile 4 versus 62.4% for quartile 1). Similar trends were observed in math.

Table 3

Corequisite Course Intensity by TSIA Quartile

Integrated Reading and Writing					
	Overall	Quartile 1	Quartile 2	Quartile 3	Quartile 4
<1 credit n	1,148	708	63	185	192
<1 credit %	(2.5%)	(4.6%)	(0.8%)	(1.4%)	(2.0%)
1 credit n	11,603	3,150	2,030	3,738	2,685
1 credit %	(25.2%)	(20.4%)	(26.7%)	(28.3%)	(27.6%)
2 credit n	4,185	1,119	922	1,033	1,111
2 credit %	(9.1%)	(7.2%)	(12.1%)	(7.8%)	(11.4%)
3 credit n	26,837	9,644	4,394	7,626	5,173
3 credit %	(58.4%)	(62.4%)	(57.7%)	(57.8%)	(53.3%)
4 credit n	2,208	840	206	610	552
4 credit %	(4.8%)	(5.4%)	(2.7%)	(4.6%)	(5.7%)
Math					
	Overall	Quartile 1	Quartile 2	Quartile 3	Quartile 4
<1 credit n	3,158	1,448	228	680	802
<1 credit %	(5.7%)	(7.9%)	(2.2%)	(4.6%)	(6.7%)
1 credit n	11,531	3,202	2,349	2,992	2,988
1 credit %	(20.7%)	(17.5%)	(22.4%)	(20.0%)	(24.8%)
2 credit n	9,198	1,778	1,923	2,935	2,562
2 credit %	(16.5%)	(9.7%)	(18.4%)	(19.6%)	(21.2%)
3 credit n	28,808	10,262	5,398	7,712	5,436
3 credit %	(51.7%)	(56.2%)	(51.5%)	(51.6%)	(45.1%)
4 credit n	3,028	1,559	578	619	272
4 credit %	(5.4%)	(8.5%)	(5.5%)	(4.1%)	(2.3%)

Inferential Analyses

To explore the relationship between different corequisite DE structures and intensities with student outcomes, we made use of a series of first-differenced regression analyses. To start, we modeled corequisite DE structure and intensity separately. Formally, we estimated the following model for students i at college j passing course y in cohort (year) t , as a function of DE

corequisite structure [concurrent (*omitted/comparison category*), sequential (*SEQ*), and non-course competency-based option (*NCBO*)], and further controlling for student demographic background (*S*) and TSIA score (*TSIA*), with a linear cohort/time indicator (λ_t) to control for any pre-existing trends in the data:

$$\text{Logit}(y_{ijt}) = \alpha + \beta_1(\text{SEQ}_{ijt}) + \beta_2(\text{NCBO}_{ijt}) + \varphi(S_{ijt}) + \theta(\text{TSIA}_{ij}) + \lambda_t + \varepsilon_{ijt} \quad (1)$$

The coefficients of interest – β_1 and β_2 – can be interpreted as the change in course-passing rates for sequential and NCBO, respectively, compared to the concurrent course prerequisite model (the most common type). We also conducted F-tests for each of these estimates to determine whether additional differences exist not only in comparison to the omitted category but also with respect to each other. To aid in interpretation, we produced predicted probabilities and the associated 95% confidence intervals for all three prerequisite DE structures. For our third outcome (the number of college-level credits earned in the first year), we use a similar set of variables; however, we model this outcome using a linear regression.

Then, to examine the relationship between prerequisite DE intensity and the student outcome measures, we adjusted Equation 1 by replacing indicators for structure with indicators for the intensity of the prerequisite course. These include whether students are enrolled in fewer than 1, 1, 2, or 4 credit hours, with 3 credit hours being the omitted/comparison group:

$$\text{Logit}(y_{ijt}) = \alpha + \beta_1(\text{FEW}_{ijt}) + \beta_2(\text{ONE}_{ijt}) + \beta_3(\text{TWO}_{ijt}) + \beta_4(\text{FOUR}_{ijt}) + \varphi(S_{ijt}) + \theta(\text{TSIA}_{ij}) + \lambda_t + \varepsilon_{ijt}$$

Like before, the coefficients of interest – β_1 , β_2 , β_3 , and β_4 – can be interpreted as the change in course-passing rates for fewer than 1, 1, 2, and 4 credit prerequisite courses, respectively, compared to 3-credit models (the most common option). We conducted the same post-regression analyses with DE intensities as we did with DE structures (e.g., F-tests, predicted probabilities, and 95% confidence intervals).

Finally, to explore whether these outcomes differ by prior academic preparation, we ran the full set of models again separately for each TSIA quartile. The results are presented graphically with the predicted probabilities for each level of course intensity and TSIA quartile.

Findings

We begin by examining the relationship between prerequisite course structure and intensity and the likelihood of taking or passing both developmental and college-level courses for IRW (Figure 2). Students enrolled in sequential courses tended to be more likely to pass the DE IRW course (77.71%) compared to students in concurrent (69.22%) and NCBO courses (57.67%). Similar trends were also observed for students in the first and third quartile of TSIA scores. However, there were no differences in passing rates in gateway English by prerequisite structure in the full sample. When disaggregating the results by TSIA quartile, the only statistically significant difference was that among students in quartile 3, those in sequential prerequisites tended to be more likely to pass gateway English than those in concurrent prerequisites (86.27% versus 77.25%, respectively).

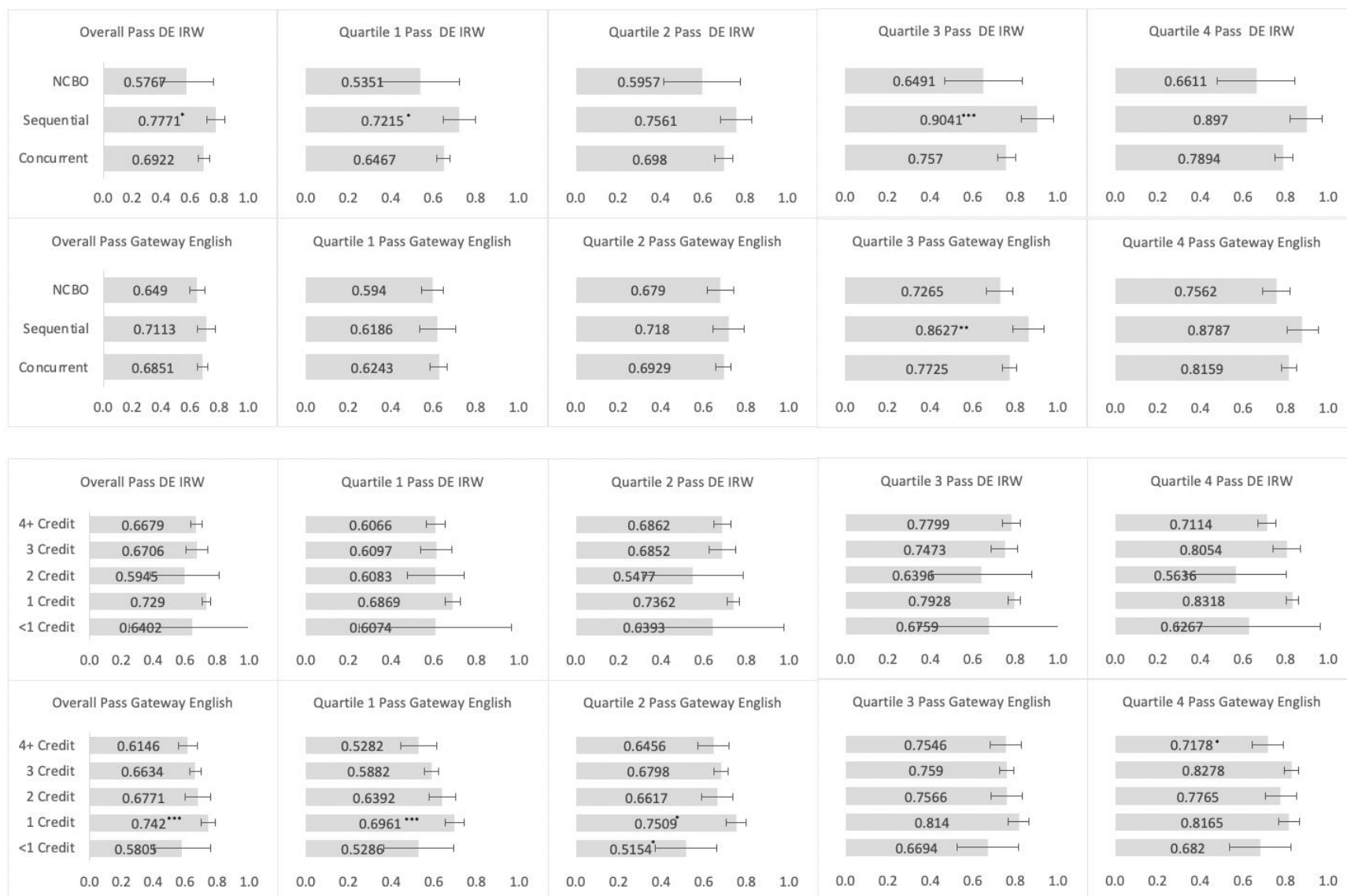


Figure 2. Predicted probability of taking and passing DE and college-level courses by IRW corequisite structure and intensity, overall and by TSIA quartile

Next, we examined differences in student outcomes based on the intensity of the IRW corequisite course. The likelihood of passing the IRW course was similar for all students regardless of the number of credits of the IRW course, both for the full sample and for each of the TSIA quartiles. However, important differences emerged by course intensity when examining the outcome of passing rates in gateway English. Students who enrolled in a 1-credit corequisite were more likely to pass gateway English relative to students enrolled in a 3-credit corequisite (74.02% versus 66.34%). For lower-performing students in the first and second TSIA quartiles, there was a similar trend with higher predicted probabilities of passing the gateway English course for 1 credit corequisites relative to 3 credit corequisites. This is particularly interesting because a low credit intensity for DE still provides extra support but poses less of a burden on students' workloads. There were few differences in the probability of passing gateway courses by level of corequisite intensity for higher-performing students. However, there was some evidence that passing rates tended to be lower for 4-credit corequisites (71.78%) relative to 3-credit corequisites (82.78%) for students in the highest quartile of TSIA.

For our next outcome of interest, we examined the relationships between IRW course structure and credits earned in the first year for students in sequential and NCBO corequisites relative to concurrent corequisites (Table 4). Among all students, there were no differences in credits earned by IRW structure. However, for mid-performing students in quartile 2, students in sequential courses tended to earn 1.046 credits more than students in concurrent courses. Additionally, for the highest performing students in quartile 4, those enrolled in NCBOs tended to earn 2.127 fewer credits relative to those enrolled in concurrent courses.

Table 4

Regressions results for the relationship between DE course structure for IRW and credits earned in the first year, for all students and by TSIA quartile

	All Students	Quartile 1 Students	Quartile 2 Students	Quartile 3 Students	Quartile 4 Students
Sequential	0.736 (0.45)	0.241 (0.63)	1.046* (0.49)	1.577 (0.94)	0.776 (0.90)
NCBO	-1.265 (0.67)	-1.37 (0.77)	-1.017 (0.73)	-1.148 (0.65)	-2.127* (0.83)
N	29,083	13,505	8,942	4,957	1,679
r ²	0.068	0.022	0.02	0.03	0.084
F(seq = ncbo)	7.31**	2.93	6.91*	6.56*	7.17**

Table 5 presents the regression results for the relationship between corequisite intensity for IRW and credits earned in the first year, where the comparison category is a traditional 3-credit hour corequisite. Similar trends of greater credits earned among students enrolled in 1-credit corequisites were observed for TSIA quartiles 1, 2, and 3.

Table 5

Regressions results for the relationship between DE course intensity for IRW and credits earned in the first year, for all students and by TSIA quartile

	All Students	Quartile 1 Students	Quartile 2 Students	Quartile 3 Students	Quartile 4 Students
<1 Credit	0.79 (0.82)	1.372 (1.38)	-0.696 (0.65)	1.243 (0.92)	2.21 (1.59)
1 Credit	1.706*** (0.5)	1.895** (0.6)	1.686** (0.53)	1.641** (0.54)	0.371 (0.81)
2 Credits	0.876 (0.6)	1.126 (0.61)	0.332 (0.77)	1.002 (0.67)	0.446 (1.06)
4+ Credits	-0.429 (0.92)	-0.279 (0.75)	-0.079 (1.06)	-0.834 (1.71)	-1.757 (1.02)
N	29,083	13,505	8,942	4,957	1,679
r ²	0.071	0.027	0.024	0.033	0.08
F(<1 = 1)	1.02	0.13	9.72**	0.17	1.14
F(<1 = 2)	0.01	0.03	1.22	0.06	0.89
F(<1 = 4)	1.04	1.15	0.26	1.20	4.74*
F(1 = 2)	1.84	1.47	3.10	0.74	0.00
F(1 = 4)	4.84*	6.57*	2.55	2.04	3.22
F(2 = 4)	1.59	2.84	0.11	1.03	2.60

Next, we examine the predicted probabilities of taking and passing DE and college-level courses by math corequisite structure and intensity (Figure 3). We find that the likelihood of passing DE math tends to be greatest for students in sequential corequisites among all students and each of the TSIA quartiles. These differences are relatively large in magnitude, with a predicted probability of passing DE math of 82.10% for sequential corequisites relative to 63.29% for NCBOs and 62.03% for concurrent corequisites in the full sample. However, there are few differences in the likelihood of passing a gateway math course by corequisite structure. Among all students, passing rates for college-level math tend to be lower for students in NCBOs (48.62%) relative to students in sequential (61.49%) and concurrent (55.17%) corequisites. When the results are disaggregated by TSIA quartile, the only difference by course intensity is that the predicted probability of passing tends to be highest for sequential corequisites among the lowest-performing students in TSIA quartile 1.

Figure 3 also shows that there are few differences in course passing rates by math corequisite intensity. Among all students, 1-credit corequisites are associated with a higher likelihood of passing DE math relative to 3-credit corequisites (69.38% versus 61.38%, respectively). However, there are no differences in likelihood of passing the college-level course by corequisite intensity for the full sample. For students in the lowest quartile of TSIA scores, 1-credit corequisites were associated with a higher likelihood of passing both DE and college-level math courses relative to 3-credit corequisites. However, for students in the other three quartiles of TSIA performance there were no differences by corequisite intensity in the likelihood of passing DE or college-level courses.

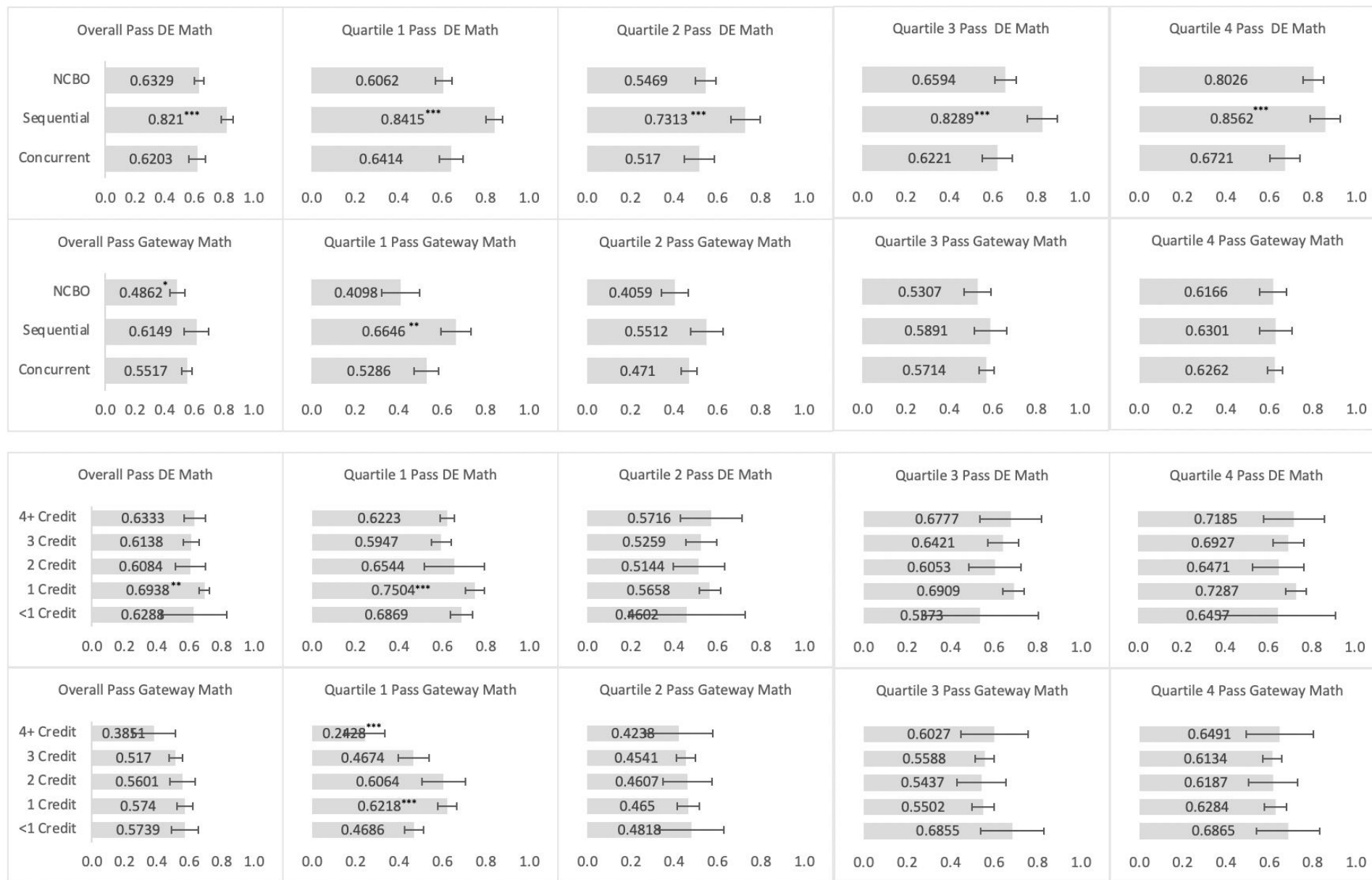


Figure 3. Predicted probability of taking and passing DE and college-level courses by math corequisite structure and intensity, overall and by TSIA quartile

Next, we examined the relationship between math corequisite structure and the number of credits earned in the first year for students in NCBOs and sequential corequisites relative to concurrent corequisites (Table 6). Among all students, enrollment in an NCBO was associated with 1.833 fewer credits earned in the first year relative to enrollment in a concurrent corequisite. When the results were disaggregated by TSIA quartile, there was a similar trend of lower credits earned in NCBOs for students in quartiles 1, 3, and 4.

Table 6

Regressions results for the relationship between DE course structure for math and credits earned in the first year, for all students and by TSIA quartile

	All Students	Quartile 1 Students	Quartile 2 Students	Quartile 3 Students	Quartile 4 Students
Sequential	0.317 (0.51)	1.084 (0.73)	0.15 (0.68)	-0.047 (0.56)	-0.284 (0.72)
NCBO	-1.833*** (0.46)	-2.514*** (0.69)	-1.078 (0.60)	-1.417* (0.58)	-1.706* (0.68)
N	55,723	18,249	10,476	14,938	12,060
r ²	0.051	0.047	0.023	0.038	0.036
F(seq = ncbo)	18.84***	38.09***	2.6	4.95*	2.85

We also examined the relationship between math corequisite intensity and the number of credits earned in the first year (Table 7). Among all students, those enrolled in less than 1-hour corequisites tended to earn 2.221 more credits in the first year relative to students enrolled in longer corequisites of 2, 3, or 4-credit hours. Students enrolled in 1-credit hour corequisites also tended to earn more credits relative to students enrolled in 4-hour corequisites. For the lowest-performing students in TSIA quartile 1, shorter corequisites of less than 1-credit or 1-credit were associated with greater credit accumulation in the first year relative to 3-credit corequisites. First quartile students also tended to accumulate less credit if they enrolled in 4-credit corequisites, relative to 3-credit corequisites. Among students in the remaining three TSIA quartiles, credit accumulation tended to be similar for most corequisite intensities.

Table 7

Regressions results for the relationship between DE course intensity for math and credits earned in the first year, for all students and by TSIA quartile

	All Students	Quartile 1 Students	Quartile 2 Students	Quartile 3 Students	Quartile 4 Students
<1 Credit	2.221** (0.81)	3.839*** (0.61)	0.243 (1.44)	2.078 (1.38)	1.015 (1.26)
1 Credit	1.351 (0.75)	3.703*** (1.00)	0.095 (0.91)	0.408 (0.80)	0.572 (0.77)
2 Credits	-0.015 (0.68)	2.234 (1.48)	0.002 (0.90)	-0.927 (0.64)	-1.078 (0.79)
4+ Credits	-1.13 (0.72)	-1.350* (0.56)	0.127 (0.90)	-0.576 (1.34)	-1.413 (0.71)
N	55,723	18,249	10,476	14,938	12,060
r ²	0.05	0.061	0.021	0.038	0.034
F(<1 = 1)	0.75	0.02	0.01	1.21	0.13
F(<1 = 2)	5.11*	1.02	0.02	4.21*	2.38
F(<1 = 4)	11.76***	76.56***	0.01	1.93	3.21
F(1 = 2)	2.62	0.82	0.01	2.08	5.55*
F(1 = 4)	6.98**	23.08***	0.00	0.47	5.12*
F(2 = 4)	1.44	5.53*	0.01	0.06	0.12

Section III

Qualitative Analysis on Corequisite Implementation

Qualitative Data Sample, Collection, and Analysis

In this multi-site case study (Yin, 2014), we conducted virtual site visits to six institutions during the fall 2021 and spring 2022 semesters for the qualitative component of this evaluation. Through a combination of semi-structured focus groups and individual interviews, we met with 16 IRW department chairs and/or faculty, 21 math department chairs and/or faculty, and 18 students who were currently enrolled in or had recently completed corequisite courses. Separate focus groups or interviews were held for IRW and math subject areas, as we anticipated different practices and perspectives from each subject area. In sum, a maximum of four focus groups or interviews were conducted per institution with the goal of answering the following research questions:

1. How do corequisite developmental offerings differ among schools, in terms of structure, intensity, and delivery method?
2. What do stakeholders perceive as the strengths and challenges of different corequisite developmental offerings?
3. What are the promising practices and additional resources needed when implementing corequisite developmental offerings?

In selecting institutions to recruit for participation, we intentionally targeted public institutions from differing economic regions of Texas, as well as a mix of two-year and four-year institutions. Table 8 shows the six economic regions represented in this sample and the sector of the institutions in the sample.

Table 8

2021-2022 Sampled Institutions for the Qualitative Analysis

College Pseudonym	Economic Region	College Sector
Longhorn College (LC)	High Plains	Two-year college
Bluebonnet College (BC)	Metroplex	Four-year college
Mockingbird College (MC)	Gulf Coast	Two-year college
Pecan College (PC)	Central	Two-year college
Armadillo University (AU)	South	Four-year university
Desert College (DC)	West	Four-year college

Sample questions asked to department chairs and/or faculty members include, “Do you offer NCBOs, either during long semester, summer sessions, or mini terms? How did your department/college decide what corequisite models to implement?” Sample questions asked to students include, “How did the content of the corequisite course align with the content on the college-level course? Were there any assignments or activities that you found particularly helpful or unhelpful?” Interview protocols are provided in appendices A and B.

After data collection, audio recordings were transcribed and sensitive or identifying information was redacted, with participants receiving copies of the redacted transcripts for early member checking. This member checking provided participants with the opportunity to expand or edit their words but was mostly used to verify the accuracy of transcripts and ensure all appropriate data were redacted for anonymity and confidentiality purposes (Merriam, 2007). Next, data analysis was conducted in several phases using Dedoose, a computer-assisted qualitative data analysis software. Central themes from the data were identified using pattern coding (Corbin & Strauss, 2015; Miles et al., 2014) wherein data were coded by a team of four researchers using a comprehensive coding framework.

The coding framework was based on an existing framework from a similar study of developmental education reform. The framework was further modified by reviewing faculty and student interview protocols, as well as reading focus group and interview transcripts and memos. During the initial phase of open coding, researchers collaboratively refined the existing framework, removed and modified a priori codes and definitions, and added new codes and definitions when necessary (Yin, 2014). Codes included broad themes such as “curricula” and “scale-up” and more specific codes such as “modality of corequisite course” and “examples of deliberation and discussion.” Reliability tests were conducted between the lead researcher and the remaining three researchers. After strong inter-rater reliability was achieved, researchers used the revised coding framework to begin coding the transcripts.

Findings from data analysis revealed great variation in the structure, intensity, and delivery methods for developmental English and math options, with some institutions offering both instructor-led and NCBO corequisites and others providing traditional developmental options for students deemed exempt from the requirements of HB 2223. Overwhelmingly, however, concurrent corequisite options were the structure of choice, with all institutions implementing corequisite courses paired with college-level English and math. Greater variation in corequisite intensity existed among math options than English, and the delivery of courses was primarily fully face-to-face or hybrid, though many institutions emphasized the importance and necessity of online courses for certain student populations. Institutions considered many factors when it came to how to offer corequisites and which options are best for various groups of students. In discussing these considerations, faculty and students revealed their perceptions of strengths and challenges of corequisite options, with promising practices and needed additional resources being identified as well.

Qualitative Findings on Corequisite Options

We begin our presentation of qualitative findings by first discussing the multiple developmental English offerings at institutions, including variations in structure, intensity, and delivery method, followed by a review of the developmental math offerings. Next, we transition to discuss findings about how institutions made decisions on which developmental offerings to provide.

Developmental English Offerings

At all six institutions, corequisite courses were 3 credit hour courses offered concurrently, paired with college-level English or other first-level college courses deemed writing-intensive (e.g., history, humanities, and sociology). Shown in Table 9, all colleges offered concurrent courses over 16 weeks, with only one institution offering an 8-week concurrent option.

Table 9

Developmental English Structures

	PC	MC	BC	DC	AU	LC
Concurrent/Paired	X	X	X	X*	X	X
Sequential						
NCBO	X				X	
Traditional DE (non-corequisite)	X	X				X

*8-week option

Two institutions offered NCBOs paired with college-level English courses for “bubble students” who nearly scored college-ready on the TSIA. PC’s NCBO and college-level pairing was 4 credit hours, while AU’s was 1 credit hour. When describing the content of NCBOs at the university, an English instructor noted that the NCBO included “a lot of conferencing” with students. She continued:

So what would happen is they [students] would submit the outline, we'd provide feedback, written feedback, intertextual feedback, then we would meet virtually and discuss that feedback. And it would be the same for the draft and then the same for the graded essay.

Across colleges, we heard from participants who emphasized that, though they were supportive of the corequisite modality of DE, this approach might not be best for all students, particularly those with lower TSIA scores. These institutions utilized the exemption to the corequisite requirements of HB 2223 for students who score at levels 1-4 on the ABE diagnostic of the TSIA (THECB, 2018), allowing students to enroll in a traditional, non-corequisite model of DE. As a result, three institutions offered traditional DE for exempt students, or those with scores of 1-4 on the ABE diagnostic of the TSIA.

The traditional DE option at MC and PC was an NCBO and IRW pairing, with MC’s NCBO set at 3 credit hours and PC’s set at 2 credit hours. An instructor at PC described the IRW and NCBO pairing, saying:

It's a 16-week class that's developmental reading and writing skills paired with a base NCBO that's meant to be just in time stuff. . . . It's a class that teaches all of these developmental skills, and we have to fold in as much as we can of the college study skills because that group is also really unprepared in that way.

At LC, students had the option to complete a self-paced NCBO that was “designed largely to catch the students that fall through the gaps” by registering late or those who “failed the corequisite.” An instructor explained, “It's an intervention for them that they can take over the winter interim or during the summer or during the spring interim. . . . If they pass it, they can enter the corequisite level the next semester.”

In addition to options regarding course-based options or NCBOs, students also had options when it came to course delivery. In the following section, we describe the various English corequisite delivery methods, as well as some faculty preferences.

English Corequisite Delivery Methods

Table 10 shows the delivery methods of corequisite options at institutions during the 2021-2022 academic year. All six institutions offered corequisite courses entirely face-to-face. In addition, three institutions indicated hybrid options where students met face-to-face at designated days and times with the remaining instruction delivered online. All six institutions provided fully-online options during the COVID-19 pandemic and continued to offer this option for students in fall 2021. Three institutions offered online corequisite courses through asynchronous options, and the remaining three institutions mentioned synchronous online options.

Table 10

English Corequisite Delivery Methods

	PC	MC	BC	DC	AU	LC
Face-to-face	X	X	X	X	X	X
Hybrid		X		X		X
Online (synchronous)		X	X		X	
Online (asynchronous)	X			X		X

Faculty at BC expressed a preference for face-to-face learning, with one instructor sharing, “I said ‘No,’ when I was offered [an online course]. I was like, ‘No, I don't teach online developmental. It's not effective. Here's some – you want research? I can give you some.’” An instructor at AU shared the belief that online learning was not the best for students completing DE, as they “don't necessarily know how to be successful students yet, and a lot of that is time management.” This instructor believed that students could be more successful “if they're kind of told, ‘Well hey, wait a minute. This is your block of time [to attend class].’”

More open to the benefits of online learning, PC decided to continue to offer synchronous online classes after they were no longer necessitated by the COVID-19 pandemic, claiming that it “seems to have attracted quite a few students from our wider service area who are willing to hop onto a virtual class.” This helped the institution “recover” some evening classes that weren't

receiving enough enrollment in previous years. Participants at other institutions acknowledged that students can be successful in online options, with one instructor claiming, “I adore both [online and face-to-face].” This instructor also acknowledged that some students simply will not attend if the online option is not available.

Next, we cover the developmental math offerings. Options varied between subjects, as more institutions offered NCBOs and traditional DE options in math than English. However, we found that in both English and math, corequisite courses were offered as concurrent options at all six institutions.

Developmental Math Offerings

As shown in Table 11, concurrent corequisite math options were offered as 3 credit hour courses at all six colleges. The corequisite options were paired with college-level math courses spanning several math pathways, or math course sequences that align with students’ academic major and career goals, including MATH 1314 (College Algebra), MATH 1414 (College Algebra for STEM majors), MATH 1342 (Elementary Statistics), MATH 1332 (Contemporary Math), or MATH 1324 (Math for Business), with the college-level math courses ranging from 3 to 4 credit hours. At PC and LC, students could also pair their corequisite course with a STEM-focused college algebra course for students whose degree plans required pre-calculus and beyond.

Table 11
Developmental Math Structures

	PC	MC	BC	DC	AU	LC
Concurrent/Paired	X*	X**	X	X*	X	X*
Sequential						
NCBO	X	X			X	X
Traditional DE (non-corequisite)		X	X			X

*8-week option

**8- and 12-week option

Concurrent courses were offered over 16 weeks at all six institutions, with MC and PC also offering a 12-week option that started later in the spring and fall semesters for students who may register after 16-week options have reached capacity. Four institutions, PC, MC, LC, and DC, offered concurrent corequisite and college-level math courses over eight weeks. At DC, there was originally a sequential developmental math and college-level math sequence, however, in the second eight-week term, instructors found themselves repeating developmental content from the first eight weeks and students tended to “burn out.” Now, the institution only offers developmental and college-level math courses concurrently over eight weeks.

MC faculty also explained a corequisite option for students wherein only developmental content is delivered during the first 4 weeks of the semester, followed by both developmental and college-level math content covered concurrently during the remaining 12 weeks. When asked about the late-start concurrent approach, a faculty member expressed, “It really worked nicely

because I had a month to kind of prepare them and we got to know each other and then the college algebra part started, and they had a good leg up.”

NCBOs were offered at three institutions, PC, AU, and LC, with the NCBOs paired with college-level math courses. AU’s 1 credit hour NCBO was described as the developmental intervention for students who were nearly college-ready per TSIA scores. PC offered NCBOs ranging from 2 to 4 credit hours depending on whether it was paired with traditional college algebra or STEM college algebra.

Compared to PC and AU, LC’s NCBO and college-level pairing was unique in that the NCBO began in the second 8 weeks of the term to give students struggling in the first 8 weeks a “second chance where they don’t have to wait an entire whole semester to pass again.” The Dean explained this opportunity sharing, “One good thing that we have going is that, provided that we can intervene in the first eight weeks, there’s a second chance where they don’t have to wait an entire whole semester to pass again.”

As with English developmental options, a total of three institutions offered traditional developmental options for students who scored lower on the TSIA and were exempt from the corequisite requirements of HB 2223. Two of the institutions, PC and MC, paired NCBOs with instructor-led, standalone developmental courses, and LC offered a self-paced, standalone NCBO for students who “didn’t even really test well into a coreq [sic].” When asked to further describe who takes this intervention, a faculty member explained:

These [students] are the lower end where they have maybe an ABE score of like a 4 or lower, so they’re really only third, fourth grade ability, and walking into a coreq [sic] would be extremely detrimental for them. They need the extra semester of beefing up some of their foundational skills before even trying [the corequisite].

Whether providing course-based options or NCBOs, students completing developmental math had a greater variety of options when it came to course delivery than students completing developmental English. In the following section, we describe the various math corequisite delivery methods, accompanied by a few faculty preferences.

Math Corequisite Delivery Methods

Across schools, students were provided with a variety of delivery methods, shown in Table 12. All institutions offered face-to-face and online options, and hybrid options were mentioned at all schools but one. Some institutions explained that they were still transitioning to have more face-to-face learning after the height of the COVID-19 pandemic. The department chair at BC noted that, “Before [the COVID-19 pandemic], I think [enrollment] was really close to 100 percent face-to-face, if not 100 percent.”

Table 12*Math Corequisite Delivery Methods*

	PC	MC	BC	DC	AU	LC
Face-to-face	X	X	X	X	X	X
Hybrid	X	X	X	X		X
Online (synchronous)	X	X	X	X		X
Online (asynchronous)					X	X

An instructor at LC explained that she had “flipped” her hybrid course and required students to watch “personally-made lecture videos” before coming to class twice per week. She described the face-to-face days, sharing:

They come into class twice a week, and we just talk. We talk about the material, because it's not the first time they've seen it, so we kind of do an overview. And then I open the floor for questions and they just start flooding me with everything that they have been struggling with. And so by the time they leave my classroom that day they have a much more solid understanding of the material than what I find students have just leaving a class after an initial lecture.

While this instructor found benefits of an online component supplemented with in-person meetings, other instructors expressed concerns about the effectiveness of fully-online options. At MC, the institution used to offer asynchronous online options, but a faculty member explained that they were stopped because “the failure rate was so high.” However, the instructor shared that there is demand from students for asynchronous courses. Despite this demand from students, the instructor felt that “it’s hard to keep track of everybody when you don’t see them.” Likewise, the developmental math coordinator at AU noted that their online asynchronous course was “not optimal.” She emphasized that it was harder for students to feel connected to instructors and, similarly, for faculty to get to know students. She summarized this feeling by saying, “They [students] feel kind of anonymous.”

While some instructors expressed preferences for face-to-face or hybrid learning, they had to balance those preferences with the needs of students and lingering safety concerns and transitions from the height of the COVID-19 pandemic. Whether schools offered face-to-face, hybrid, online, or all three options, institutions made decisions in consideration of their institutional contexts and student preferences and characteristics.

Institutional Decision-Making

When asked about how the institution made decisions regarding course offerings in light of HB 2223, the English department chair at DC pointed out that input came from faculty in the department. He shared, “Our leadership does not give us the schedule or dictate that to us. We have kind of had those conversations ourselves. . . . It tends to be a continual reflection [of enrollment].” Indeed, the English department chair shared that course offerings were largely dependent upon enrollment, with the institution “experiment[ing] with what times of day, what days of the week, what [order of courses] work[s] better.” Likewise, collaboration was described

among math instructors at DC, with a faculty member sharing, “We, as a team, come together and we look at research and we do our thing, we come together and make these decisions on what we’re going to do moving forward.”

One institution recently consolidated from multiple institutions into one institution with multiple campuses, and, as a result, the source of the decisions regarding the implementation of HB 2223 was unclear to English faculty. When discussing the decision to offer IRW and ENGL 1301 concurrently, one instructor remarked, “[We] all serve on our curriculum committee for [IRW], and [my colleague] serves on the English curriculum committee. It did not come from us. It came from somewhere else.” A fellow faculty member agreed, stating, “We would just get broad declarations of, ‘This is what will be taking place now.’”

Similarly, the developmental math coordinator at AU noted that their early adoption of corequisites “was a decision not from the math department. It was a decision from leadership that we were gonna [sic] dip our feet in these waters.” This early adoption of corequisites “was all kind of in conjunction with the math pathways movement,” and the institution piloted NCBOs around 2014 with “just a few students” before making it available to all students in 2016. Like AU, PC also adopted a corequisite approach to developmental math prior to HB 2223. The math coordinator at PC noted, “We could be very picky about who we invited to the coreq [sic], and so our prereqs [sic] were pretty tough. Now with HB 2223, we don’t have as many choices.”

While LC did not adopt corequisites as early as PC or AU, the institution began offering concurrent courses before HB 2223. A math faculty member at LC made a similar comment about being selective during the initial scale up of corequisite courses, noting that the students chosen for the corequisite had already completed a standalone developmental course so they “just had to do intermediate [developmental course] and college algebra in one semester.” On the English side at LC, a faculty member “brought the idea of corequisite learning” to the attention of his colleagues which prompted the discussion on how many credit hours the corequisite course should be. According to one instructor, faculty members considered the combination of developmental reading and writing content along with the addition of the college-level English course when determining the credit hours for the corequisite and college-level pairing. An instructor shared, “[We decided] 3 hours for the support [corequisite] course and 3 hours for [English]. . . . We already felt like we were moving from 6 hours to 3. We just didn’t feel like we could squish it anymore.” In addition to considering how to combine developmental and college-level content, considerations were made for how students should be placed into the various corequisite options, which we discuss next.

Placement Considerations for Students

Among institutions that offered multiple types of corequisite courses in the same subject area, decisions needed to be made about how to advise students about which option to select. Multiple institutions reported that they used advising “flowcharts” that indicate the recommended option for students, usually based on TSIA scores. At one institution, a faculty member noted that instructors intentionally “get together and we revamp [the flowchart] so that the students are properly placed” every few years. According to one faculty member, the advising flowcharts also

indicate “which students need to be placed into the corequisite and actually which students are not quite ready for the corequisite.” She continued, explaining that their “goal from the beginning was also to keep [advising charts] as simple as possible because if it’s confusing to us, students are going to be completely lost.” While we did not speak with advisors about their placement practices, a faculty member at LC shared, “Advisors are extremely knowledgeable and well equipped to quiz and interview students to find out what their life circumstances are.” She added:

I would say that the primary decision on where students are placed and which modality they choose has everything to do with what’s going on in their lives and whether they can be full-time students, part-time students, whether they’re parents, work full-time during the day.

In fact, this instructor noted that her fully-online section requires students to seek permission to enroll to “save some spots for those true students, nontraditional mostly, who have kids, who are working full-time, that need those spots.” She continued, emphasizing, “We don’t want those spots filled up by students who are actually staying in the dorms and just really don’t feel like getting up and walking across campus to attend a corequisite.”

Student preferences were also considered in placements, with students expressing preferences when it came to course delivery methods. One face-to-face student stated, “I learn better in person than online.” Similarly, another student explained, “I chose to come in person because I get more motivated in person.” Two students were completing online courses at the time we spoke with them. While one student who originally hoped to take the course in person was unable to due to lack of seat availability, the other student preferred the online option because of familial obligations. A student at another institution shared that she was actually repeating courses in person, as she had failed them in the online format the semester before.

While some instructors expressed preferences for face-to-face learning, they had to balance those preferences with the needs of students and their ability levels. The math coordinator at DC explained that enrollment in the 8- and 16-week courses was “split” by test scores, saying, “The bottom half go for the 16-week, the upper half go for the 8-week.” In placing students, she shared that advisors “use holistic advising” and consider students’ background, test scores, and how recently students graduated from high school. Depending on the length of the course and whether it is taken fully face-to-face or hybrid, students can meet up to four days per week. Like DC, students at LC used to have a four days per week option, however, the Dean explained that many of their students commute to campus and “don’t want to drive four days week, 35-45 miles a day to take a coreq [sic], even though I think that’s what’s best.” He added, “If all our students lived in the same town, we’d probably have more face to face like some of the bigger schools.”

In the sections that follow, we discuss the reported strengths of corequisites, as well as promising practices that were revealed by institutions, before discussing the challenges associated with corequisites and additional resources that would benefit institutions in implementing corequisite offerings.

Strengths of Corequisites

Instructors shared a plethora of opinions on the advantages of the corequisite model. Primarily, instructors across math and English emphasized the benefit of students having the opportunity to earn college-level credit while completing developmental coursework. Additionally, the timely application of the skills students learned in corequisites helped to facilitate student learning in college-level courses. Faculty also found that frequently meeting with students, at times up to four days a week, helped to reinforce course content.

Ability to Earn College-Level Credit

One of the most frequently heard advantages was the fact that students are able to earn college-level credit instead of being delayed by traditional developmental course sequences. As one instructor at PC put it, “But when [students] take [the] coreq [sic], they finish that semester with credits on their degree plan and a class on their transcript. So, it’s like the carrot is part of the system, you know.” An LC instructor felt similarly, saying, “They get two birds with one stone.” She added, “They get through the developmental and the college [level] in one semester. They get to graduate on time and not have to do 3 semesters of math before they even get one college-level credit.” The coordinator at LC called this “a huge win,” as one of the most prevalent critiques of traditional DE is the length of course sequences which results in increased time and money for students, with many students not completing traditional sequences.

Timely Application of Skill Development

By syncing the developmental course along with the college-level course, instructors also believed that it allowed students to apply the skills they were learning in their developmental course more easily. For example, “Teaching grammar, the developmental skills in and of themselves, when they're isolated from actual writing, from what they're actually doing, is incredibly problematic,” according to an instructor at LC. At DC, the instructor also emphasized the importance of integrating the two courses, sharing, “I explain to them, ‘I'm giving you the fundamentals, the skills that you need. I want you now to execute them in your [ENGL] 1301 class.’” Likewise, a faculty member at AU agreed, saying, “It's one cohesive idea. There's no busywork. Everything that you do in IRW or [NCBO] directly impacts your success in English 1301, so it's a good sell.” Students alike agreed about the cohesion of developmental and college-level content, with one student appreciating that her IRW class was followed immediately by her ENGL 1301 course as she found herself “practicing some grammar” and “examples” from the corequisite course in the college-level course.

Frequency of Contact

In completing developmental and college-level courses concurrently, faculty noted that the frequency of contact aided student learning, with one PC instructor sharing, “I think four days is awesome. . . . it's great because they don't have time to forget anything, or at least less time to forget things.” The frequency of meetings, combined with the ability to provide just-in-time instruction, also cut down on repetition and prevented students from “having to remember everything from the semester before.” Similarly, the math department chair at BC stated:

I don't have just 3 hours a week, I have 6 hours a week. So, you have probably ample time to give one-on-one attention, to give – slow down the pace of the course, cover the material, and spend long periods of time on a specific topic.

The corequisite approach's benefits of allowing students to earn college-level credit while remediating skills, shortening the time necessary to complete developmental coursework, also allowed faculty to implement just-in-time instruction and enabled students to apply the skills learned in developmental lessons directly to college-level coursework without any lag time. In addition to these strengths, we discovered promising practices implemented across institutions that served to help promote student success.

Promising Practices

Important promising practices were revealed as we spoke with faculty and students, including the availability of multiple academic supports, instructor autonomy inside the classroom, and the continuity of instructors between developmental and college-level sections. Instructor continuity between developmental and college-level sections also proved to be promising for just-in-time remediation, wherein students receive additional help or support at the point in the college-level course when they need it, as well as frequently meeting with students. Internal and external collaboration also proved beneficial to institutions when implementing corequisites.

Availability of Academic Supports

Faculty shared a variety of academic supports available to students, both inside and outside of the classroom. These academic supports included class trips to the writing lab, inviting the tutoring coordinator to visit classes, and holding classes in computer labs. However, one of the more active academic supports included embedding tutors or supplemental instructors into classes. Across institutions, supplemental instructors were available to assist students during or after class, often fielding questions from students and providing individual support. At BC, a faculty member believed the supplemental instructors "helped a lot." Faculty at DC also spoke favorably of supplemental instructors, with one instructor explaining that the supplemental instructor "literally sits in the class and so, she's – or he's – fully aware of what's going on in the class and has sessions for students to sign up for to get extra help in the classes." An IRW instructor remembered how crucial her supplemental instructor was for one student who experienced a traumatic brain injury, saying, "I don't think he would have made it without the supplemental instructor." Likewise, at LC, funding from a Title V grant ensured "peer instructional coaches were embedded within some classes, and regularly held virtual office hours to assist students."

While embedded tutors or supplemental instructors were described as beneficial across institutions, faculty frequently noted that the availability of more passive academic support services did not guarantee student utilization. To encourage students to take advantage of the many academic supports available to them, faculty sometimes incentivize or require participation as part of courses. At BC, for example, a faculty member who required students to visit the tutoring center before submitting each essay noted, "It gets them used to some of the instructional support they wouldn't have otherwise probably gotten there. And, also, it helps

point them out to become a little more self-sufficient.” AU’s IRW coordinator similarly requires visits to the school’s writing center before each essay, and a faculty member at MC incentivizes students to use academic supports by providing extra credit for using an online, external tutoring service to receive feedback on papers.

Instructor Autonomy and Continuity

Instructors described autonomy over which academic supports they incorporated into their classes, as well as autonomy over course content and pedagogical practices. While some institutions had “broad consistency” across sections of courses, such as the same number of essays or topics to be covered, instructors often had autonomy in how to deliver content. As a faculty member at BC explained, “We have a lot of flexibility in that as long as we are able to cover the content. And different faculty use different teaching methods.” Instructor autonomy was especially beneficial when the same instructor taught both the developmental and college-level courses, as instructors could introduce supports as needed.

Commenting further on the benefits of instructor continuity, the department chair at LC shared, “[One of the] best aspects of the way we do the co-req [sic] is that each instructor is the teacher of both the support course and the college-level [course].” The chairperson noted that this was a “big advantage,” as the instructor was “the master and the person who is able to make those decisions, and there’s no need to have to collaborate with another faculty member.” Similarly, another school chose a one-instructor model for IRW, according to the IRW program coordinator, “because we’d heard from a lot of other colleges who rushed implementing coreqs [sic] faster than we did that the model seemed to work best.”

On the math side, PC instructors regularly participated in team teaching, where each corequisite paired course had two instructors to facilitate both the developmental and college-level portions of the course. An instructor at PC thought co-instruction or co-teaching was the only way to collaborate with another instructor within the corequisite model. She shared, “We sort of kind of didn’t know any different before that,” adding:

We have someone to sort of just cover the class – or even answer questions, if there were questions, you know, then one of us can go over and help somebody as the other person maybe was still explaining or whatever the case might be. So that was definitely an advantage.

When instructor continuity existed between the developmental and college-level courses, faculty could more easily identify student strengths and weaknesses and incorporate just-in-time content as needed, compared to a two-instructor model that requires frequent communication and collaboration between the faculty member teaching the developmental portion and the faculty member teaching the college-level course. One instructor commented on this, saying:

If it’s the same instructor, they know what the deficiencies of that group of students are, whereas if I’m teaching separately, I come in and I teach the developmental piece, and someone else teaches the credit piece. You know, that means that there’s some

collaboration that needs to continue between the two, and the timing of the material of when you teach the material in that sense.

At AU, an instructor agreed, speaking candidly about how her experiences teaching both developmental and college-level courses aided in informing her pedagogy. She expressed, “I’m teaching them the developmental math, I’m using the data that I have to find out what they’re confused about, and then we’re applying that and digging into the college level material.” A student commented that the content in her courses was “seamless” in that she could not tell the difference between the days on which she “attended” her developmental class versus her college-level class.

Frequency of Contact with Students

Further, when instructors met with students up to four times per week, this allowed them to break content down into smaller lessons to help students master both developmental and college-level material. One PC instructor explained, “With it being so much information, I think meeting four days a week we’re able to chunk it. . . . Even though it’s four days, I think it gives them smaller bites of it.” An enthusiastic faculty member at DC shared, “I think four days is awesome. . . . It’s great because they don’t have time to forget anything, or at least less time to forget things.” Further, an instructor at LC believed that students who recently graduated from high school “tend to favor an environment where they are going to be exposed to [content] regularly,” helping to further justify frequently meeting with students.

Internal and External Collaboration

To help advisors learn about and understand the various options that students among different types of corequisite courses, frequently meeting with advisors were described as beneficial by multiple institutions. At PC, for example, the coordinator of developmental math noted leading trainings with advisors twice per year, supplementing the flowcharts and flyers she designed to help explain course options and appropriately place students. Frequent conversations between English and math developmental coordinators and advisors also occurred at AU, as the English coordinator shared, “[My colleague] and I have regular meetings with the director for the advisors. Sometimes we will be invited to the advisors’ weekly Wednesday meeting to go over the placement guideline for the developmental students.”

In addition to internal meetings between those implementing corequisites, networking with faculty at other colleges was also described as helpful. Faculty explained that opportunities for networking usually existed at trainings or convenings, and many enjoyed hearing about other schools’ challenges and successes. Specifically, faculty at MC even reported visiting a college in another state to see how they implemented corequisites, as “they were the first ones that implemented it.” An instructor at LC mentioned appreciating hearing “how [other schools] were pairing classes or what classes were being paired with what, and just to hear some of the struggles.” Next, we detail some of the challenges institutions faced implementing corequisites, followed by the additional supports that can be provided to help with implementation.

Challenges of Corequisites

Despite the many perceived advantages of corequisites and promising practices discovered, some faculty also believed there were disadvantages. Specifically, faculty shared that the amount of work required for instructors and students alike was cumbersome. Although students had the ability to apply skills learned in corequisite options to college-level English courses, some IRW faculty felt that there was now a lack of emphasis on reading skills, an area in which many students struggle. Faculty pointed out that students do not have to earn a passing grade in corequisite courses, which led some students to focus more on their college-level course instead of investing in the corequisite content as they would if a passing grade were required. Lastly, faculty struggled with how to adequately remediate skills among underprepared students enrolled in corequisite courses while also ensuring mastery of college-level content. To begin, we discuss the increased workload experienced by faculty and students in corequisites.

Increased Workload of Corequisites

For DC, the institution that operates primarily on an 8-week schedule, students whose schedules necessitated taking both English and math developmental and college-level courses at the same time spent many hours in class every day. Regardless of the length of the term, faculty across institutions believed that the developmental course paired with the college-level course was “a lot of work.” As one instructor put it, “So actually, honestly, a student could take a full schedule with just two corequisite courses, a full load of 12 hours with just math corequisite and English corequisite.” Taking both English and math corequisites at the same time was also described as “keeping a lot of plates spinning, as it were. And that’s both the teacher and the student.” Speaking to the workload of faculty, an instructor at PC explained, “We cover so much information. Like, obviously we have to do that because it’s two classes essentially. And so, in a sense of a disadvantage, it’s so much information.”

Lack of Emphasis on Reading Comprehension

Specific to IRW, faculty noted that, with the pairing of IRW with ENGL 1301, they “lost a bulk of the skills for increasing [students’] reading comprehension, and that is where most of these students are deficient.” Likewise, one LC instructor emphasized “In the rush to meet the requirements of the state-level learning objectives, et cetera for English 1301, there are times when you have to dump the support pieces and to be practically minded about managing the time.” As one instructor put it:

English 1301 is a composition course. Yes, there’s reading. Yes, of course, but it is a writing course, and I think being paired with that course is what has led to the drop-off of some of the emphasis for the significance of these reading skills.

To help incorporate more reading skills, an instructor at BC explained that she has students read and answer comprehension questions for students who students “struggle with understanding what they’re reading and connecting ideas.” She added that this “also helps the students with vocabulary,” as “these students tend to be pretty vocabulary deficient.”

Disregard for Grades in Corequisites

In managing both developmental and college-level courses at once, faculty took issue with the fact that students do not have to pass corequisite courses to progress to the next college-level course. An instructor at AU commented on this, saying, “If the student figures that out, then they just completely blow off the developmental course and just pass any way they can the [college-level course].” A similar sentiment was expressed by an instructor at BC, who said, “The [college-level] course becomes the priority because all the student needs to do is get a C or better. . . . When that is very clearly the carrot, then [students think], ‘Why do I bother doing anything else?’” To combat this, LC began assigning students the same grade for the corequisite and college-level courses since the courses are integrated and the same instructor teaches both courses.

Struggles in Corequisites for Underprepared Students

While faculty sometimes struggled to manage all of the content, both developmental and college-level, in one semester, the former chair at LC also worried about the success of academically underprepared students who were not exempt from HB 2223 and now enrolled in a corequisite course, noting, “I have at least six students in my class that this coreq [sic] is killing them.” He added, “They need to go back and take just a [developmental] class by itself and just try to let it bake and soak and try to get it to stick, and it was just too fast, too much.” It is important to note that this institution offers traditional developmental options for students, however, not all students who struggle in corequisites may be eligible for the exemption to HB 2223.

This sentiment was shared by a colleague at LC who also felt that some students struggled to learn both developmental and college-level content at once. She shared:

What I find is that now that we're at 100 percent coreq [sic], the big disadvantage from the teaching perspective is that I feel like some of these students who really needed to be in development, like beginning algebra instead of a coreq [sic], they are being just kind of tossed around like in a washing machine in this course and they're not grabbing much, they're just getting more and more frustrated. And some of that is on them not reaching out for help, not seeking the support that they need but some of it is also just on the course design: you're covering a giant amount of information on a very fast pace.

While the faculty we spoke with seemed willing to try new approaches and adapt teaching methods to promote student success, they expressed needing additional supports to help with the implementation of corequisites.

Additional Supports Needed for Corequisite Implementation

In light of the disadvantages described by faculty, additional supports needed for corequisite implementation were revealed and include a desire for training that focused more on successful existing corequisite programs, as well as intentional training for advisors who must work with students to ensure accurate placement and compliance with the legislation. Further, support for faculty who are credentialed only to teach developmental courses would help decrease faculty turnover for institutions that wish to move to a one-instructor model, and greater guidance on

how to implement corequisites for underprepared students would help discourage schools from enrolling lower-scoring students in traditional developmental options.

Need for More Applied Training

At the onset of implementing HB 2223, faculty described professional development or training opportunities provided by various organizations including the College Academic Support Program (CASP), the Carnegie Foundation, Catch the Next, Complete College America, the Dana Center, the Texas Community College Teachers Association (TCCTA), the Texas Corequisites Project, and the THECB. However, despite attending training opportunities, participants often expressed that the convenings were more of a space for institutions to discuss approaches they were taking to corequisites, rather than guided trainings on how to effectively implement corequisites. Specifically, the department chair at DC expressed that they were looking for examples of successful models of corequisites that had been implemented elsewhere. He explained:

There was some training at the beginning, right, when they started trying to bring this – you know, when the house bill came out there was some training on the front end of “This is what it’s going to look like. What’s your plans? How are we going to put this together correct?” There was something like that. But we didn’t have really anything – any training to say, “Hey, there’s a model that other schools are doing,” Right, because it’s brand new to us. “Let’s go learn from that model. Let’s go and learn what they’re doing.” There hasn’t been any trainings that we’ve had the opportunity to go in and improve upon what we’re doing.

External Training for Advisors

Further, some faculty noted feeling like a “mouthpiece” when they were able to attend external trainings, with the responsibility lying with them to disseminate information to others at their institution. For example, department chairs and coordinators described subsequent meetings with advisors to train and educate them on corequisites. Despite informing advisors of the legislation, the former department chair at DC revealed, “Sometimes, a student was put in [a traditional developmental course] that should have been in the coreq [sic], but the advisor is just trying to get them registered and get them moved on.” After discovering this, the department chair shared how they responded, adding, “We communicated more effectively with our advising team so that they understood: It’s not just a capacity thing. It’s a compliance thing. And they started to understand and register students better.”

Despite attempts to adequately train advisors regarding the nuances of course options and the use of advising flowcharts, one faculty member expressed concern about how one of her courses is described to students by advisors. She shared:

I do believe that some extra education to the advisors, for math specifically, at least, might be something we would want to evaluate possibly in the future because . . . I have my business math corequisite students come in and they’re all bright and shiny and ready to start because advisors have essentially sugarcoated the course to make them think that this is just like any other course. And it’s really not. It’s a lot more intense.

While some colleges described intentionally training advisors or holding regular meetings with advisors to prevent such situations, increased external trainings on how implementation impacts the role of advising and targeted supports for advisors could help to lessen the burden on department chairs, coordinators, and faculty when it comes to ensuring advisors understand the importance and requirements of being compliant with legislation.

Support for Faculty Credentialing

Another concern raised in the focus groups was that some institutions were unable to offer instructor continuity across developmental and college-level courses because instructors had to hold a master's degree in the subject area or a minimum of 18 credit hours in the subject area to teach the college-level component of the course. Thus, at institutions where instructor continuity was the model of choice for corequisites and college-level courses, some instructors who historically taught developmental courses only prior to HB 2223 had to choose between meeting the criteria outlined by accreditors to teach the college-level courses or finding alternate employment. While we did not speak with instructors who went through this process, we did hear about this issue from faculty at BC who knew instructors in such situations. Specifically, a faculty member recounted:

Last spring, I guess it was, someone in our new administration contacted those people and told them that we would be moving to a same instructor corequisite model and that they had an option to either go back to school and to earn the credits needed to be able to teach English, or they would no longer have work.

In instances where institutions wish to move to a one-instructor model, additional financial support to enable faculty to return to school to meet the criteria necessary to teach both developmental and college-level courses would help promote the promising practice of instructor continuity. Without this support, some instructors may refuse to comply with new requirements, resulting in faculty turnover and potential difficulties for institutions in finding a sufficient number of instructors qualified to teach both developmental and college-level courses.

Guidance on Implementing Corequisites for Severely Underprepared Students

Among traditional developmental faculty and college-level faculty alike, the shared belief that corequisites were not beneficial for all students, particularly those with lower TSIA scores, led some schools to ensure there were traditional developmental options for students with lower TSIA scores. One institution, in particular, was unaware of the exemption to HB 2223 that allowed students with lower TSIA scores to complete traditional developmental options. Upon learning about the exemption, the department chair at DC emphasized:

I can say that if I knew that [some students could be exempt from corequisites] and could have that documentation and make that update to curriculum, I would much rather students that are in that lowest level – in their first eight weeks, I would love if they'd take our basic learning frameworks course – which is for all first time in college – and then, an [IRW] where they can just focus on learning those real fundamental reading and writing skills. And they complete that, and then, in their second [8-week] term, either go

into our regular coreq [sic], if that's what they still need or, if they're college ready, then they can take the English in the second [8-week term].

Additionally, other institutions expressed that though some students may have scored slightly above the threshold for exemption, they may still struggle taking both developmental and college-level courses at the same time. In response, one MC instructor suggested delaying the start college-level course and focusing on remediating skills in the first few weeks of the semester. She commented:

I think that there are some things that we can do to tweak [corequisites]. And I don't know if that means . . . having [developmental only] for four weeks first and really inundating the student with the things that they've missed, the concepts that they've missed before they go into the [college-level] class. I don't know what the answer is. That's an idea that maybe we should try to put forth and act on and at least test it to see if it works.

To be clear, faculty did not express the desire to eliminate corequisites. In fact, institutions displayed strict fidelity in implementation, ensuring that all students who were supposed to be enrolled in corequisites; only students who met the exemption requirements of HB 2223 were allowed to enroll in traditional developmental options. At the same time, however, many faculty simply noted that the pressure of remediating skills while also teaching new, college-level skills in one semester was a challenge for certain student populations. As a result, better guidance on how to implement corequisites for severely underprepared students could help institutions develop innovative solutions instead of placing said students in traditional developmental classes. As we cover next in our quantitative findings, differences in student success can be attributed to the various structures of corequisite offerings, and schools should continue to carefully consider which structures are best for which groups of students.

Section IV

Implications and Directions for Future Research

The findings from this initial year report suggest the following implications and direction for future research:

Colleges should continue to make individual decisions about the DE course structures offered to their students. Our findings do not identify a single “magic bullet” course structure that works best for all students. Instead, we find that the impacts of course structure vary by subject area and by prior academic achievement. At the same time, we find that colleges are making intentional decisions about the kind of DE course structure to offer based upon the needs of their students and the available resources. Other states would be wise to adopt this level of flexibility in implementation as they consider statewide corequisite reform policies.

Even a single credit of corequisite DE support can help students—and may help more than a traditional 3-credit DE corequisite course. Our findings suggest that the probability of passing a gateway English course tends to be greater in 1-credit IRW corequisites relative to 3-credit corequisites, particularly for lower-performing students. Additionally, the number of college-level credits in the first year tends to be greater for students in 1-credit IRW corequisites relative to 3-credit corequisites. This further supports the notion that corequisite DE courses do not need to be a traditional 3-credit course and that short-term interventions may help students more, particularly lower-performing students.

Colleges would do well to develop a culture of communication and collaboration, both within their own institutions and with other institutions. Specifically, ensuring that academic supports are widely available and accessible, inside and outside of the classroom, can help foster student success. Intentionally scheduling courses so that the same instructor(s) teaches both the developmental and college-level sections of the course helps provide instructors with an awareness of student strengths and areas that may need to be adapted to remediate skills. Frequently meeting with or making contact with students, up to four days a week in some instances, can be a beneficial way to distribute lessons and reinforce content. Also important is allowing instructors flexibility in how to deliver content and autonomy over teaching methods. We also encourage institutions to collaboratively engage internally and externally, providing opportunities for faculty to connect with one another and with advisors to help ensure that students are appropriately placed into various course options. Providing opportunities for cross-institution collaboration can also help the sharing of best practices and lessons learned.

More research is needed on how the effects of corequisite course structure and intensity may vary for different student subgroups. While our models include indicators for students’ race/ethnicity, sex, and economic disadvantage, the next stage of our research will explore how these factors may moderate the effect of corequisite course structure and intensity. Given that prior research has demonstrated that corequisite developmental reform, in general, has the greatest benefits for Black and Hispanic students (Park-Gaghan & Mokher, 2021), it is essential that we explore whether this also holds when delving deeper into course structure and intensity.

References

- Belfield, C., Jenkins, P. D., & Lahr, H. E. (2016). *Is corequisite remediation cost-effective? Early findings from Tennessee*. Community College Research Center, Columbia University. <https://academiccommons.columbia.edu/catalog/ac:197866>
- Boatman, A., & Long, B. T. (2018). Does remediation work for all students? How the effects of postsecondary remedial and developmental courses vary by level of academic preparation. *Educational Evaluation and Policy Analysis*, 40(1), 29-58.
- Cho, S. W., Kopko, E., Jenkins, D., & Jaggars, S. S. (2012). *New evidence of success for community college remedial English students: Tracking the outcomes of students in the Accelerated Learning Program (ALP)*. Community College Research Center, Columbia University. <https://files.eric.ed.gov/fulltext/ED538995.pdf>
- Clotfelter, C. T., Ladd, H. F., Muschkin, C., & Vigdor, J. L. (2015). Developmental education in North Carolina community colleges. *Educational Evaluation and Policy Analysis*, 37(3), 354-375. <https://doi.org/10.3102/0162373714547267>
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks: Sage.
- Creswell, J. W., & Clark, V.L.P. (2011). *Designing and conducting mixed methods research*. Thousand Oaks: Sage.
- Denley, T. (2015). *Co-requisite remediation pilot study—fall 2014 and spring 2015*. http://www.ticua.org/meetings_resources/sm_files/TBR%20CoRequisite%20Remediation.pdf
- Edgecombe, N. (2011). *Accelerating the academic achievement of students referred to developmental education* (CCRC Working Paper No. 30). Community College Research Center, Columbia University.
- Jaggars, S. S., Hodara, M., Cho, S. W., & Xu, D. (2015). Three accelerated developmental education programs: Features, student outcomes, and implications. *Community College Review*, 43(1), 3-26.
- Logue, A. W., Douglas, D., & Watanabe-Rose, M. (2019). Corequisite mathematics remediation: Results over time and in different contexts. *Educational Evaluation and Policy Analysis*, 41(3), 294-315.
- Merriam, S. B. (2007). *Qualitative research and case study applications in education* (2nd ed.). San Francisco: Jossey-Bass.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. Thousand Oaks: Sage.
- Miller, T., Daugherty, L., Martorell, P., Gerber, R., LiCalsi, C., Tanenbaum, C., & Medway, R. (2020). *Assessing the effect of corequisite English instruction using a randomized*

- controlled trial*. American Institutes for Research. <https://collegecompletionnetwork.org/sites/default/files/2020-05/ExpermntlEvidncCoreqRemed-508.pdf>
- Morse, J. M. (2003). Principles of mixed methods and multimethod research design. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 189-208). Thousand Oaks: Sage.
- Park-Gaghan, T. J., & Mokher, C. G. (presented 2021, October). *Better together? The impact of statewide corequisite developmental education policy*. Paper presented at CPPHE Virtual Pre-conference, Association for the Study of Higher Education. (National) Retrieved from https://convention2.allacademic.com/one/ashe/ashe21/index.php?cmd=Online+Program+View+Paper&selected_paper_id=1873855&PHPSESSID=c8m47i9fto630j0nrf9lo55j98
- Ran, F. X., & Lin, Y. (2019). *The effects of corequisite remediation: Evidence from a statewide reform in Tennessee*. Columbia University, Teachers College, Community College Research Center. <https://files.eric.ed.gov/fulltext/ED600570.pdf>
- Scott-Clayton, J., & Rodriguez, O. (2015). Development, discouragement, or diversion? New evidence on the effects of college remediation policy. *Education Finance and Policy*, 10(1), 4-45. <https://doi.org/10.3386/w18328>
- Texas Higher Education Coordinating Board. (2018). *FAQs HB 2223 Implementation*. <http://www.thecb.state.tx.us/reports/PDF/10716.PDF?CFID=75220234&CFTOKEN=58522132>
- Yin, R. (2014). *Case Study Research: Design and Methods* (5th ed.). Thousand Oaks: Sage.

Appendix A

Protocol Questions for Department Chairs and Faculty

1. Please describe the structure and content of the corequisite courses offered in your department.
 - a. What are the names of the college-level courses that have corequisites, and what are the names of the developmental courses that support them? How many credit hours (0, 1, 2, 3, or 4) is each course worth?
 - b. Are they offered as paired 16-week concurrent courses? Two sequential 8-week + 8-week courses? Does the same instructor teach both courses within a pair? If not, is there any collaboration among the two instructors? Are the courses taught by group instruction? Are they self-paced?
2. Do you offer non-course based options (NCBOs), either during long semesters, summer sessions, or mini-terms? How did your department/college decide what corequisite models to implement?
 - a. What opportunities were there for open discussion, dialogue, and deliberation about scaling up corequisite instruction? For example, were meetings, convenings, conferences, and/or seminars held? To what extent did participants find that these meetings helped them to understand the changes needed to scale-up corequisite DE and develop motivation for implementing the changes?
 - b. What information did you consider when making this decision?
3. Talk to us about changes (for example, content, scaling or other improvements) that you have made to the corequisite courses that you offer, including how COVID may have influenced your offerings.
4. Tell us about the advising process for different corequisite course options.
 - a. Is there any collaboration or conversation between instructors and advisors? How are advisors informed and educated on your corequisite course options?
 - b. What factors are considered when matching students to different corequisite course content and delivery options? Do you implement a Multiple Measures model for placing students into college-level courses that would otherwise enroll in a corequisite model?
5. Can you tell us more about the content of your different corequisite courses?
 - a. To what extent is there overlap with the associated college-level course? Was there an additional required textbook for the corequisite class? Did departments require the same materials for all corequisite classes?
 - b. If your department offers corequisite courses with different credit hours, how is the additional time spent in the courses with more credit hours?
6. What teaching methods do you find most beneficial for corequisite courses?
 - a. Can you give me some examples of ways you've had to change your teaching for corequisite courses relative to your teaching of traditional developmental education courses?

- b. What are some of the differences among the different types of corequisite courses offered by your department in terms of pedagogy/methods of delivery, or order and pacing of course material?
- 7. How do you use instructional supports (for example, technology, supplemental instruction, tutoring) in your corequisite course(s)?
- 8. To what extent do students take advantage of the availability of instructional supports outside of the classroom? Do students seem to take advantage and participate in some support activities and events more than others?
- 9. Have you seen evidence of these external instructional supports influencing students' learning? If so, how?
- 10. How do corequisite course options differ in the ways that they help students learn?
 - a. Focus on student and course aspects such as academic preparation, race/ethnicity, English language learners, gender, age, time of day course offered
 - b. How do classroom dynamics differ across course options?
 - c. Did you notice different levels of success based on the structure or length of the corequisite course?
- 11. What are your perceptions of the effectiveness of corequisites relative to traditional developmental education courses?
 - a. Overall, what do you see as the greatest advantages of corequisite courses relative to traditional developmental education courses?
 - b. What are some disadvantages?
- 12. What external resources or supports did your institution or campus use or receive throughout the process of implementing corequisite instruction? For example, did your institution receive a grant, participate in professional development, or receive support in priority setting from external organizations like the THECB or the Dana Center? To what extent did these resources or supports help to facilitate the scale-up of corequisite instruction?
- 13. Can you share instances where you were personally involved or encouraged others to engage with networks of individuals who were also implementing corequisite instruction or who had experience with corequisite instruction, such as instructors at other institutions or members of professional associations? Did you learn approaches or techniques from these networks that you were able to take back to your institution or campus?
- 14. What didn't we ask that you thought or wished we would? Is there anything that we didn't ask you about that you would like to share with us

Appendix B

Protocol Questions for Students

1. What corequisite (paired/support) courses in math or English (Integrated Reading and Writing) are you taking or have you taken?
 - a. Were they offered as paired 16-week concurrent courses? Two sequential 8-week + 8-week courses? Were the courses taught by group instruction? Were the courses self-paced?
 - b. How many credit hours was each course worth (0, 1, 2, 3, or 4)?
2. What, if any, other corequisite options did you receive information about?
 - a. How did you decide which corequisite courses to take?
3. Tell me about the corequisite courses themselves.
 - a. What was the pace of the courses like?
 - b. Was your course face-to-face, hybrid, or online? Was the course a non-course based option (NCBO)? What is the average amount of time per week that you spent in or out of class working on your corequisite courses?
 - c. How effective was the developmental support course in terms of preparing you for the next college-level course in that subject?
 - d. Could the developmental course have done anything better to prepare you for the college-level course?
 - e. How did the content of the corequisite course align with the content of the college-level course?
 - f. Were there any assignments or activities that you found particularly helpful or unhelpful?
 - g. If you took a sequential pair of corequisite courses, to what extent did you continue to receive support from your corequisite instructor while taking the college-level course?
4. Tell me about any student support options for the corequisite courses such as mathematics tutoring or writing labs, or supplemental instruction or academic coaching (hours, scheduling, use?).
 - a. How frequently did you use these support options? Were you required to go to tutoring centers or writing labs? Did you find these support options beneficial? Why or why not?
 - b. Were support options available online? If not, how did the location of support options impact how often you used the support option? Did the hours of operation of the support option impact how often you used the support option?
 - c. To what extent were you able to receive the support that you were looking for?
 - d. Have you continued to use any of these supports for any other courses that you have taken?
5. What other resources did you turn to or use when you needed help?
 - a. How did you know which resources existed to help you?
6. What advice would you give an incoming student about enrolling in a corequisite course model?

7. What else do you want to tell us about your experience in corequisite courses that we haven't thought to ask you?