
Implementation of High School-to-College Transition Courses in Four States



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The Community College Research Center (CCRC), Teachers College, Columbia University, conducts research on the major issues affecting community colleges in the United States and contributes to the development of practice and policy that expands access to higher education and promotes success for all students.

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Inside This Report

Though college enrollment is on the rise, too many students continue to be underprepared for postsecondary coursework. To address this problem, many states, colleges, and high school districts have worked together to design courses that aim to improve college readiness while students are still in high school. Called transition courses, they are designed to help students avoid postsecondary remediation in math and English and become better prepared for the challenges of college.

This report is based on a qualitative study examining the implementation of transition courses in four states: California, New York, Tennessee, and West Virginia. The report relies primarily on interviews with faculty, administrators, and students as well as classroom observations and publicly available documentation. The implementation of transition courses varied across states, incorporating different curricular activities and pedagogical approaches to improve students' knowledge and skills in the fundamentals of math and English. This report discusses the differences and similarities among the courses; it also describes associated professional development opportunities, the teachers and students who participated in the courses, and the obstacles and facilitators that the various actors experienced as they were implementing the transition courses in their respective states.

In examining the implementation of transition courses across the states, we find several commonalities and some important contrasts. The curricula and implementation varied significantly among states, but the teachers generally had the same goals in mind. Teachers wanted students to be well prepared for college-level coursework and to be successful at practical math, reading, and writing requirements in the workplace. The courses were principally designed to review and reinforce materials students had already been exposed to. Some of the curricula were more formalized and prescriptive, while others permitted individual teachers greater flexibility and latitude in decision making. Professional development also played an important role in shaping the implementation of the courses, although the types offered varied considerably. Not surprisingly, schools that fostered a culture of innovation, had strong faculty buy-in, or had a strong relationship with external partners appeared to implement transition courses with more ease than schools that did not exhibit one or more of these qualities. Financial constraints, low student engagement, or lack of explicit mechanisms to place out of developmental education in college were commonly cited hindrances to implementation and success.

Transition courses hold promise as a way to help students finish high school ready to undertake college-level coursework, particularly as the momentum for preparing all students for college is building. Still, research on how to design and implement transition courses well is in its infancy; the ways in which high schools and colleges can successfully work together to improve student readiness for college *earlier* require further attention. For example, how might high schools and colleges come to a consensus on the definition of college readiness? Can transition courses prepare students on the margin of college readiness as well as students well below this benchmark for college-level coursework? As with any initiative, considerable thought needs to be given to the design of transition courses to make sure that they are effective and sustainable.

Introduction

A growing number of high schools across the country are working to help students prepare for college by implementing transition curricula—courses, learning modules, or online tutorials developed jointly by secondary and postsecondary faculty and offered no later than 12th grade to students at risk of being placed into remedial math or English coursework when they enter college (Barnett, Fay, Trimble, & Pheatt, 2013). Transition curricula, especially transition courses, have the potential to reshape the transition to college. Typically offered as a regular credit-bearing course in the senior year of high school, transition courses engage students who have not met college-readiness benchmarks on junior-year state accountability tests in college-preparatory math and English. Rather than taking the form of add-on student supports, these courses become part of the regular school schedule and are funded through existing revenue streams. Their aim is to allow students to develop college-level skills in reading, writing, analysis, and numeracy, and thus reduce the need for remedial or developmental education in college. If students then require little or no remediation in college, they will be more likely to pass their courses, persist, and complete credentials (Bailey, Jeong, & Cho, 2010). Transition courses can also teach students about the nonacademic aspects of college success, making the transition to college smoother and more successful.

The Community College Research Center (CCRC) at Teachers College, Columbia University, is engaged in a multiyear study of transition courses as part of a project entitled *Reshaping the College Transition*. In previous reports, we documented the prevalence of early college readiness assessments and transition curricula across the United States (see Barnett, Fay, Bork, & Weiss, 2013) and examined the relevant policies and programmatic designs in four states—California, New York City, Tennessee, and West Virginia (see Barnett, Fay, Trimble, et al., 2013)—where transition courses have at least some degree of centralization and oversight. In the current report, we describe how transition courses were implemented in the same four states. In the next and final report, we will present our findings on the impact on student outcomes of participating in transition courses in New York City and West Virginia.

To conduct our study of transition course implementation, we employed a qualitative research design and conducted site visits at four to six schools in each of the four states in 2013 and 2014. At each of the 18 schools we visited, we conducted face-to-face interviews with three to five people who oversaw or taught transition courses in math or English, as well as counselors who placed students into them. We conducted student focus groups at each school and observed classes whenever possible. The interviews and focus groups were guided by semi-structured interview protocols, and an observation guide was used in classroom observations. The data gathered were coded using ATLAS.ti software and analyzed for themes and patterns; the results are summarized in this report. A more complete description of our methods, including a sample school visit schedule, is included in the appendix.

The Problems Addressed

Large numbers of students in the United States graduate high school and enter college only to discover that they are not deemed ready for college-level coursework. In 2012, 80 percent of students graduated from high school within four years (Stetser & Stillwell, 2014), and 66 percent of them entered college immediately after high school (U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, 2013). Of these, 68 percent of community college students and 40 percent of those attending open-access four-year colleges were placed into remedial courses. Students who place into remediation are much less likely to earn a credential than those who place into college-level courses (Bailey et al., 2010).

A part of the reason students arrive at college underprepared is the historical misalignment between high schools and colleges. Scholars (e.g., Kirst & Venezia, 2001) and practitioners have documented a range of problems that have resulted from the different standards used in K-12 and postsecondary education. High school students may study material that is more important for high school graduation than for success in college. They frequently lack adequate preparation for college-level coursework and have little understanding of college expectations.

In response to this issue, high schools are increasingly administering tests to 11th-grade students to provide them with information on how well prepared they are for college-level coursework in math and English. Many students are taking assessments associated with the Common Core State Standards such as PARRC and Smarter Balanced; others take the SAT, ACT, or other tests that include college-readiness benchmarks. However, students who score below college-readiness benchmarks often do not have the support they need to improve their knowledge and skills. Transition courses, offered in the 12th grade, can help improve students' academic preparation—particularly when there is strong collaboration between high schools and colleges to develop the courses.

In addition to being academically underprepared, students are often unprepared for college in other ways. They may not have been exposed to college expectations or modes of critical analysis, and they may not have the social know-how to successfully navigate important college choices and demands (Deil-Amen & Rosenbaum, 2003). Thus, the senior year of high school, and transition courses in particular, offers a critical opportunity to prepare students for college in multiple ways, increasing their chances of success and graduation.

Background on Transition Courses

A national scan conducted in late 2012 to ascertain the prevalence of transition courses found that they were offered in 29 states (Barnett, Fay, Trimble, et al., 2013). Various types were identified, including face-to-face and online formats; the majority were developed locally by individual high schools or districts, sometimes in partnership with colleges. In only eight states were there statewide initiatives, led by either a K-12 agency or a higher education agency. More courses were offered in math than in English. In subsequent research in California, New York City, Tennessee, and West Virginia, we learned more about the goals, development, features, and oversight of transition courses, as described below (Barnett, Fay, Bork, et al., 2013).

The Goal of Transition Courses

In the four states we studied in 2012–13, transition courses were viewed by policymakers and practitioners as a mechanism to prepare students for college-level math and English. In some instances, transition courses were also designed to provide information about college expectations, norms, and admissions processes.

Course Development

Course development was initiated by different groups, as shown in Table 1. In Tennessee and West Virginia, where transition courses were mandated by the state, course development was organized by state K-12 agencies, although more recently, higher education institutions in Tennessee developed an additional transition math course option. In California and New York City, where course participation is optional, course development was initiated by the higher education sector. However, all courses were created with input from both higher education and K-12 faculty.

	CA	NY	TN	WV
Math				
Higher education	X	X	X ^a	
K-12			X ^b	X
English				
Higher education	X	X		
K-12				X

^a SAILS only.

^b Bridge Math only.

Course Features

Table 2 summarizes key features of the transition courses we studied in California, New York City, Tennessee, and West Virginia as of the end of 2014.

Table 2. Summary of Transition Course Designs in Four States

State	Description
California (English and math)	<p>The Expository Reading and Writing Course (ERWC), along with its professional development component, was developed in 2004 by the California State University (CSU) system to address incoming students' lack of college readiness. It is comprised of 12 modules that meet college-preparatory expectations in English for the University of California and CSU systems. Students who were originally considered conditionally ready for college, based on early college readiness assessments taken in the junior year of high school, are considered college-ready in English if they successfully complete the ERWC.</p> <p>There is no widely implemented math transition course curriculum in California. However, faculty from Sierra College and CSU Sacramento collaborated with teachers from Placer County schools to create a locally available transition course in math—the Early Assessment Program (EAP) Senior Math course—to help students who are on track to attend college but lack the math skills required. Students who complete the course are eligible to take college-level math courses at Sierra College.</p>
New York City (English and math)	<p>The At Home in College (AHC) program was developed by the City University of New York (CUNY). The English course was implemented in spring 2009, while the math course was first offered during the 2010–11 academic year. The AHC English course aims to expose high school students to nonfiction texts in collegiate fields of study. Students study topics in psychology during the first semester and in sociology in the second semester. The math course is designed to help students place into college-level math.</p> <p>In addition, the AHC program includes components to prepare high school students for success in college, including a counselor-led curriculum on the transition to college. Students also receive scholarships to cover the CUNY application fee, assistance with completing the Free Application for Federal Student Aid (FAFSA), and advisement during the summer after high school graduation.</p>
Tennessee (math)	<p>Since the 2012–13 academic year, students in Tennessee have been required to take four years of high school math to graduate. The Bridge Math course was developed by the Tennessee Board of Regents as a lower level, college-preparatory, senior-year math option. The aim was to have students college-ready upon completion.</p> <p>In the same year, Chattanooga State Community College began offering an alternative version of Bridge Math called SAILS (Seamless Alignment and Integrated Learning Support), the curriculum for which was identical to the one used for the developmental education math sequence in state community colleges. With extensive support from college-based SAILS coordinators, high school teachers guide students as they study online modules that teach five sets of math competencies. Students who complete all five modules are considered college-ready and are eligible to take college-level math courses at any Tennessee college or university.</p>
West Virginia (English and math)	<p>By legislative mandate, transition courses in math and English are offered at every West Virginia public high school as part of the standard set of senior course options. Their development was led by the West Virginia Department of Education, with support from the Higher Education Commission. The math course, Transition Mathematics for Seniors, was completed and first offered in 2009. The course consists of a set of modules that review previously covered content in greater depth in order to prepare students for college-level math. Transition English for Seniors replaced English 12 OR as the official English transition course in 2014. Teachers are encouraged to use the Southern Regional Education Board's (SREB) Math Ready and Literacy Ready curriculum materials to address the standards for these courses.</p>

Course Availability

As a result of the courses' differing origins and associated mandates, rates of school participation varied across the four states (see Table 3). All schools in West Virginia offered transition courses in math and English, and all schools in Tennessee offered either Bridge Math or the SAILS course. In New York City, fewer than a quarter of high schools offered math or English transition courses. In California, a growing number of school districts (about 50 percent of comprehensive high schools) offered the ERWC; almost none offered a transition math course—these were available only where a course had been locally developed, such as the EAP Senior Math course associated with Sierra College.

Table 3. School/District Choices in Offering Transition Courses

	CA	NY	TN	WV
Math				
Required statewide			X	X
Optional, locally available	X	X		
English				
Required statewide				X
Optional, locally available	X	X		

Results of Implementation Research

Based on our site visits, we first describe the curriculum and pedagogy used in each state’s transition courses in mathematics and/or English. Then, in a cross-state analysis, we synthesize our observations regarding course content, format, and goals; student assessment systems; students and teachers in transition courses; and secondary–postsecondary collaboration. We then examine the factors that facilitated or hindered the implementation of transition courses in the four states we studied.

Curriculum and Pedagogy

California’s Expository Reading and Writing Course

Description of curriculum: The Expository Reading and Writing (ERWC) course is designed to prepare college-bound seniors for the literacy demands of higher education. The content of the course is aligned to the seven criteria of the University of California English requirements and the California Common Core State Standards for English Language Arts. The University of California English courses require frequent writing, from brainstorming to final papers, as well as reading of classic and modern literature. The ERWC curriculum is designed to focus on expository texts with complex academic language and emphasizes the use of text-based evidence in arguments.

The yearlong course contains 12 modules, many of which focus on current social issues. The course instructor is required to choose at least eight of these and may add complementary content. Additionally, the selected modules must include two full books (*Into the Wild* and either *Brave New World* or *1984*). The modules are sequenced according to the difficulty of texts and the extent to which they encourage student independence; they are typically taught in the order presented in Table 4. The curriculum utilizes a rhetorical approach to reading and writing in each module, which moves beyond a focus on comprehension to inquiries about the author’s purpose and message, the effects of a text on an audience, and genre.

Table 4. Expository Reading and Writing Course Modules

Module	Topic
Module 1	What’s Next? Thinking About Life After High School
Module 2	The Rhetoric of the Op-Ed Page: Ethos, Pathos, and Logos
Module 3	Racial Profiling
Module 4	The Value of Life
Module 5	Good Food/Bad Food
Module 6	<i>Into the Wild</i> (Book module)
Module 7	Bring a Text You Like to Class: Bridging Out-of-School and In-School Literacies
Module 8	Juvenile Justice
Module 9	Language, Gender, and Culture
Module 10	<i>1984</i> (Book module)
Module 11	<i>Brave New World</i> (Book module)
Module 12	Bullying: A Research Project

Source: California State University, 2013.

Both students and instructors reported that the course requires a high volume of reading and writing. By increasing the opportunity to read and write, the course endeavors to strengthen students' skills. As one instructor told us, "For them, it's practice, because they don't [write] enough. And I think that's what we're trying to adopt school-wide. You write in every discipline."

The curriculum explicitly incorporates opportunities for students to learn about how to plan for the future. The first module, "What's Next? Thinking About Life After High School," helps students reflect on the pros and cons of attending college versus moving directly into a job, the application process for admission to college, and financial aid. The module also addresses challenges faced by underrepresented youth in college. At the end of the module, each student writes either a personal statement for a college application or a statement of purpose to be used in a job application. Almost every teacher includes this module in the course.

Delivery of curriculum: The ERWC curriculum is structured to create flexibility for instructors by allowing them to choose any eight out of the 12 modules they would like to teach, and to supplement the official curriculum with their own material as long as key writing assignments are completed. Teachers may also skip or substitute readings if a module has several texts. This structure enables individual instructors or English departments to shape the delivery of the course and tweak the curriculum to meet their school's standards or students' needs.

In some cases, local decisions were made to make sure students were exposed to classic works of literature. For instance, one instructor remarked, "The department agreed to do the major core works. So kids still get *Macbeth*; they still get *The Stranger*. [There] is enough flexibility in the ERWC units that we are able to do that." The course's flexibility also allows instructors to include texts that they believe will engage students and reduce their resistance to the volume of reading assignments. One instructor described a reading assignment that students found particularly engaging: "I start off with *Always Running* by Luis Rodriguez. They love it; it's a page-turner. You know, they love the language. They love the violence. They love it all."

However, creators of the program have become concerned that too much flexibility may mean that some teachers are unable to complete all eight of the required modules. To address this issue, the course developers have moved toward reducing flexibility to ensure that all the course requirements are met.

California's Early Assessment Program Senior Math Course

Description of curriculum: The Early Assessment Program (EAP) Senior Math course, developed by Sierra College and partnering school districts, consists of eight units. Each unit includes key concepts, activities for facilitating students' understanding of these concepts, and the learning standards addressed. For example, Unit 2 (Linear Equations) includes a list of eight learning standards that are addressed through classroom activities that emphasize reasoning abstractly and quantitatively and learning how to construct viable arguments. See Table 5 for an overview of the topics included in the course.

Table 5. Early Assessment Program Senior Math Course Units

Unit	Topic
Unit 1	Problem Solving
Unit 2	Linear Equations
Unit 3	Quadratic Equations
Unit 4	Linear Equations and Inequalities
Unit 5	Exponential Functions
Unit 6	Logarithms
Unit 7	Absolute Value and Piecewise
Unit 8	Math of Finance

Source: Placer County Office of Education (n.d.).

In discussing the EAP Senior Math course, numerous stakeholders mentioned the extensive collaboration between K-12 and higher education stakeholders around content development. The curriculum development process involved collaboration between high school teachers, math professors from Sierra College, representatives from CSU Sacramento, and the Placer County Office of Education. Feedback from college faculty about what skills and knowledge were essential to students' preparation for college-level coursework was used to select or develop material. As one teacher explained:

One of the things ... was when we wrote the curriculum, or compiled the curriculum—you know, a lot of it comes from other places—we had the entire math department of Sierra College then look at it and say what's missing. ... We wanted to make sure that it covered everything they needed to know.

An instructor at another high school also reported that they designed the materials to align with the demands of higher education:

These are the things that we think every student, in order to be successful in math in college, should have a very strong foundation with. Again, CSU Sacramento and Sierra College were there as well. ... From there, we started developing a curriculum that wasn't rote repetition ... more of "let's engage their thinking."

Preparing students for the next level sometimes required removing topics from the curriculum that were not aligned with the college's definition of college readiness in math. According to one high school teacher:

One of the things we used to do in Algebra II is, we spent a lot of time on circles, cubits or conics, parabolas, et cetera, and then ... found out [the college doesn't] care if they know that stuff. And so, you know, we were like, "Oh, we need to dial this back."

Teachers also reported that the EAP Senior Math course was aligned to the Common Core State Standards, with its emphasis on developing students' conceptual, rather than procedural, under-

standing of math. Stakeholders were enthusiastic about the course's focus on building conceptual understanding. Students especially commented on the real-world relevance of the financial management unit and the hands-on activities in the course.

A number of instructors described hands-on activities that they implemented in the course to help students learn concepts. For example, an instructor described an in-class activity:

We actually built catapults. We were launching things, and we dealt with time. We dealt with time and the height, the distance of it, and we started looking at how all the variables relate to each other. ... So, it's basically again, providing reason to the math.

A unique aspect of the EAP Senior Math course is that it includes lessons on financial management. The real-world applicability of these lessons helped students to engage with math more meaningfully, and they felt they were developing knowledge that would be useful in life. One student told us:

I think especially for us being younger, all of those terms—mutual fund, IRA—that sounds so scary and confusing, and then, like, some of the things that we've watched, it makes it a lot simpler and easy to understand. I think it will help us a lot.

Delivery of curriculum: The course did not have a textbook at the time of our study, although one was in development. Teachers accessed the course's curricular materials via a Blackboard website. In contrast with typical high school courses—which have a specified amount of material to be covered in a given timeframe—this curriculum allowed teachers to tailor the pace to students' needs. One teacher commented, “As kids understand, we move on. ... As kids don't understand, then we slow down and we take time. ... I know the objectives that Sierra and [CSU] Sacramento want covered.”

Another teacher described how the flexibility of the course's pacing enabled instructors to spend more time on particular topics to help students develop a deeper understanding: “So, this course has the luxury of being able to go deeper and reach some conceptual understanding that maybe the other standards-based classes don't have time to do.”

Students reported that they liked learning without a textbook, as this enabled them to focus on understanding content rather than memorizing text. One student remarked:

That's another thing that I think is really good about it because you don't have the textbook. ... With this, it's more you're learning it through other people. When I have somebody explain something to me, I get it so much more, rather than reading a textbook with numbers and letters.

Teachers told us that the conceptual and hands-on nature of the course sometimes helped students understand math in a way that they had not previously experienced. For example, one instructor described a student's dramatic reaction to understanding a concept:

He doesn't like to sit a lot, and a lot of times he does his work standing up. One day, he gets out of his chair, and he jumps up and down. He goes, "I got it, I got it." I mean, those kinds of things have not happened to me in 28 years.

New York City's At Home in College English Course

Description of curriculum: The At Home in College (AHC) English curriculum was created by CUNY faculty in collaboration with CUNY's Office of Collaborative Programs and comprises two semester-long segments. The first is a psychology segment called "Why People Do What They Do," and the second is a sociology segment is entitled "The Sociological Imagination." According to project leaders, the curriculum is delivered in a student-centered, teacher-led format and aims to help students develop college-ready skills in reading and writing and to prepare them for the corresponding CUNY placement exams.

The curriculum is broken into five units, with units 1–3 (first semester) focused on psychology topics and units 4–5 (second semester) focused on sociology topics. Each unit contains an overarching theory, goals for skills that students will develop in reading and writing, a text or series of short texts, and practice exercises for CUNY placement test preparation. The five units are shown in Table 6.

Unit	Topic
Unit 1	Mindset—Fixed vs. Growth
Unit 2	The Intrinsic/Extrinsic Distinction
Unit 3	Maslow's Hierarchy of Needs
Unit 4	Kohlberg's Theory of Moral Development
Unit 5	Parenting Styles

Source: Laurel-Petterson (2013).

One instructor described how the course helped students develop skills that would prepare them for college by exposing them to college-level academic disciplines:

We're looking through the lens, a sociological lens in the second term and a psychological lens in the first term. And so I think, that in itself, I mean, all the social sciences—that's a big part of the college experience.

We often observed that teachers addressed college readiness according to their own conception of what students require to be successful in college. This included creating a syllabus for the course that mimicked a college syllabus, and employing Socratic dialogue in class to develop students' ability to discuss texts. In addition, school stakeholders agreed that the course helped students to build skills in annotation, and that it emphasized nonfiction texts that prepared students for the CUNY placement tests.

While some reported that the course was an effective way to help students develop essential knowledge and skills, others believed that the course was not rigorous enough to prepare them for

the demands of college. A number of instructors noted that the emphasis on short, nonfiction texts might not prepare students adequately for college English courses, where they would be expected to read longer fictional texts. For instance, one instructor stated:

I don't know, I think it would be really difficult because you are not teaching any literature, and kids need that. ... There needs to be a balance between fiction and nonfiction, and it's really important. ... They're going to have to take an English 101; they will be reading fiction.

In one school in the study, stakeholders reported that the AHC English curriculum was not as strong as the school's regular 12th-grade English course with regard to writing. The AHC English instructor described the difference between the school's college-readiness standards and the aims of the AHC course:

In our school, the idea of college readiness means that you can develop a thesis, you can support that thesis with textual evidence, you can look at the other side of the argument, and then debunk that argument. That's what college readiness means in English class. What ... this class supports is more like annotation, which our kids have mastered in ninth grade.

Some respondents believed that the course was often engaging for students because of its focus on sociological and psychological topics. This quote from a student illustrates that students were engaged by the curriculum, and felt that a unique aspect of the course was the opportunities it provided for them to develop their own ideas: "We discuss issues. We use our brains and we talk about emotional issues, psychiatry stuff basically, like why you think things are acting like that, why do you think a person acts this way."

One student also reported that the course helps students to develop college-ready writing skills and to understand what college-level writing is: "Like the writing. She's helping us with how, like, we're supposed to write, and we're writing at college levels."

Delivery of curriculum: The teachers we interviewed varied considerably in the extent to which they followed the AHC English curriculum and in their motivations for deviating from it. Several teachers reported generally following the curriculum but supplementing or tweaking the material to make the course more appropriate for their students' needs and more engaging. One instructor added a full-length text to the curriculum because she felt that the focus on shorter texts would not prepare students adequately for retaking the New York State's accountability tests called Regents exams:

For the first two years, I stuck to it religiously because at the time I think it fit those students that I had better. This year ... I included *Fist, Stick, Knife, Gun*, a full [book, because] there aren't any full-text, full novels or nonfiction books that they read in this course. It's all very, very short pieces. So this semester, for the first time, I did include a full book because my kids will be sitting for the Regents in January and the CUNY placement test next Tuesday.

Another instructor explained that she used the AHC curriculum as a guide, but she selected most of the course materials: “I’m just taking out what I feel is most useful and applicable. So, I’m using the CUNY book as a model text, sort of, for how I might create my questions.” This instructor went on to explain that there were numerous reasons that she deviated from the official curriculum. One was her desire to help students develop skills that they would need to perform well on new 12th-grade assessments. Additionally, she wanted to align her curriculum with the school’s 12th-grade history curriculum.

In sum, teachers found that the various assessments and standards they needed to consider—from the placement tests and Regents exams to local assessments—made strict adherence to the transition curriculum difficult. The fact that the AHC course is not tied to an assessment for which teachers are held accountable may also result in a more uneven implementation of the course curriculum across schools.

New York City’s At Home in College Math Course

Description of curriculum: The AHC mathematics curriculum was originally developed for students who had earned their GED to prepare for CUNY’s placement test in mathematics (the COMPASS test) and later was adapted for use with high school students.

The AHC math curriculum is a 308-page document, with topics broken down into 47 class sessions that include worksheets, in-class exercises, and assessments. Each class explores a different mathematical concept or topic, beginning with addition and subtraction in the first two classes and progressing to multiplication of multiple numbers with exponents in the 43rd class. The last four classes focus on test-taking strategies and preparation for the CUNY placement test. See Table 7 for a summary of the topics covered by AHC math curriculum. Although the topics are arranged in a list, they are interwoven throughout the AHC math curriculum and do not appear in sequential order.

Table 7. At Home in College Math Curriculum

1.	Operations with signed numbers
2.	Exponents
3.	Combining terms
4.	Equivalent fractions
5.	Rates of change
6.	Working with polynomials
7.	Linear functions
8.	Averages
9.	Multiplying and factoring polynomials
10.	Rational expressions

Source: Hinds, Masciotti, & Rosenthal (n.d.).

An instructor of the AHC math course noted that while the curriculum is lengthy, no material exceeds ninth-grade level math, saying, “No geometry, no trigonometry, calculus; it’s straight up pre-algebra/algebra.”

Delivery of curriculum: We have limited qualitative data on the delivery of the AHC math curriculum, as only two of the four high schools we visited in New York City offered the course.

One instructor interviewed reported that he did not strictly adhere to the curriculum: “I don’t feel like it goes as in-depth as you would need to go to sort of master certain topics.” He combined materials from the curriculum with other resources. As he explained:

So I think what I’ve tried to do over the last few years is kind of refine the curriculum to best prepare the kids for the COMPASS exam. . . . So it’s kind of this hybrid of using the materials that are provided, using materials that I’ve generated just from having taught algebra so much over the years, or practice sets or things that I think are appropriate.

The course was designed to push students to explain their mathematical thinking, and uses very little lecture. In one class that we visited, the students started out the period working on a problem dealing with percentages that was written on the board: “360 students attended a basketball game; 50 percent are freshmen; 30 percent are sophomores. Juniors were half of the number of sophomores. What percent are seniors?” Much of the rest of the class was spent working on similar problems on worksheets individually and in small groups. The teacher emphasized that the practice questions were taken from the COMPASS website and were authentic items. In addition, the teacher took the opportunity to explain to students some of the math skills that are needed for different college majors and careers. In a later interview with the instructor, he mentioned that the diverse levels of student proficiency in the class made the course difficult to instruct; some students were far under grade level, and other students were quite advanced.

New York City’s At Home in College Counseling Curriculum

Description of curriculum: A unique aspect of the AHC transition courses is the inclusion of a College Access and Success curriculum designed to prepare students for the nonacademic aspects of the transition to college. Ideally, this curriculum is taught weekly by a high school counselor and focuses on topics such as college applications, financial aid applications, and navigation of the CUNY system. The counseling curriculum was generally embedded in the AHC English course and was not always available to students enrolled in only the AHC math course.

Many counselors described the counseling curriculum as a preparation for the administrative demands that students would encounter during their transition to college. Fall semester activities focus on the college application process, while spring semester activities prepare students for what they will encounter when they start college and seek to dispel myths they may believe about college. See Table 8 for an overview of the curriculum.

Table 8. At Home in College Counseling Curriculum	
Lesson	Topic
Lesson 1	Introduction to At Home in College
Lesson 2	Understanding College Placement Exams
Lesson 3	Career Interests and Majors
Lesson 4	Colleges and Degree Types at CUNY
Lesson 5	Interviewing College Alumni
Lesson 6	Understanding Community Colleges
Lesson 7	Which CUNYs Are for Me?
Lesson 8	Applying to CUNY
Lesson 9	Introducing Financial Aid
Lesson 10	College Planning
Lesson 11	Financial Aid Resources
Lesson 12	What Are the Costs of College?
Lesson 13	Preparing to Complete the FAFSA
Lesson 14	Preparing to Complete the FAFSA II
Lesson 15	Applying for Tuition Assistance Program
Lesson 16	FAFSA Follow-Up/Time Management
Lesson 17	Looking at College Calendars and Schedules
Lesson 18	College Schedules That Work for You
Lesson 19	Transition to College Life
Lesson 20	Preparing for the College Trip
Lesson 21	College Trip
Lesson 22	Awareness of College Resources
Lesson 23	Setting the Stage to Study
Lesson 24	Looking at Our Pathway Forward

Source: Research Foundation of the City University of New York (2010).

One counselor described her teaching as follows:

So my role in the class is to do like a college access and success workshop. So ideally, I push into the class once a week ... and we do a lot of mini-lessons on college, what it takes to get into college, choosing the correct majors, filling out the applications. They take their placement exam through this program, so preparing them for the placement exam, what to expect. Just the whole college application process. ... We actually fill out the CUNY applications as a cohort.

This counselor also implemented activities to help students become familiar with the CUNY website and different campus offices and resources they would need to navigate. Another counselor described the goals of the counseling curriculum this way:

So you really try to focus on the kids [and tell them], when you go to college, this is how you're going to manage your time; this is what you're going to have to do. It's no more [teacher] calling you and babying you ... and of course the most important thing is different expectations and different workloads.

As the quote above describes, the curriculum is designed to help students develop soft skills that they will need to be successful in college, such as time management and self-advocacy.

Delivery of curriculum: We observed that the AHC counseling curriculum was not offered in all schools. Most of the counselors we interviewed, however, reported that they followed the prescribed curriculum, and most saw it as having value for students. One counselor explained that students appreciate having an additional counselor to go to with questions about college: “I think that they like it, and it gives them a mini College Now [CUNY’s college-preparatory workshops] class. I think they’re receptive to it.” However, one counselor was less enthusiastic:

So every Friday I go in, and I do two class periods of college readiness. So it’s been really interesting because the curriculum, I’m not a fan of at all. ... It’s very dry, to be honest. It’s a little difficult for me because last year, our college counselor did it, but this year she decided she really didn’t want to do it, so I got it.

She went on to say that the curriculum did not focus sufficiently on building the skills, such as time management or organizational strategies, that she felt would be helpful for students to learn.

Students interviewed generally valued the college-access aspect of the curriculum. At one high school in particular, students reported that the support provided in navigating the college application process and the CUNY application fee waiver were helpful in giving them a leg up in the college preparation process.

Tennessee’s Bridge Math Course

Description of curriculum: Tennessee’s 12th-grade Bridge Math curriculum is aligned to the Tennessee State Mathematics Standards and the Common Core State Standards, with an emphasis on revisiting concepts, making connections between key ideas, and applications. The Bridge curriculum contains 15 knowledge domains, and each domain contains five to nine standards. The Bridge Math text is published by McGraw Hill and covers the content outlined in Table 9.

Our research team conducted site visits at two high schools implementing the Bridge Math course. We also visited one high school implementing a Bridge Math/SAILS hybrid course, where classroom instruction was supplemented with lab time during which students completed the SAILS modules online. Interviewed teachers indicated that the Bridge Math curriculum addressed a vast array of topics and skills. One teacher stated, “So it’s really a wide spread, and if you look at the standards for the Bridge Math course, there is a very wide ... it is just encompassing so many concepts, ranging from pre-algebra, pre-calculus.”

Domain	Example of a Standard
Diagrammatic mathematics	Identify the graph of a linear inequality on the number line.
Verbal mathematics	Understand that a line parallel to one side of a triangle divides the other two proportionally, and conversely.
Symbolic mathematics	Operate with numbers expressed in scientific notation.
Graphic mathematics	Understand that a linear function models a situation in which a quantity changes at a constant rate, m , relative to another.
Numeric mathematics	Understand that there are numbers that are not rational numbers, called irrational numbers, e.g., π , e , and $\sqrt{2}$, which together with the rational numbers form the real number system that satisfies the laws of arithmetic.
Symbolic and diagrammatic mathematics	Solve a linear inequality and provide an interpretation of the solution.
Symbolic and verbal mathematics	Explain, solve, and/or draw conclusions for complex problems using relationships and elementary number concepts.
Symbolic and numeric mathematics	Use the rules of exponents to develop an understanding of the difference between the rational and real numbers.
Symbolic and graphic mathematics	Graphically represent the solution to a linear equation and the solution to a system of linear equations in two variables.
Numeric and graphic mathematics	Given a variety of appropriate information, determine the equation of a line.
Numeric and diagrammatic mathematics	Understand and use basic counting techniques in contextual settings.
Applications with numbers	Solve problems using scientific notation.
Applications with geometry	Solve problems involving ratios in geometric settings, such as similar figures and right triangle distance problems.
Applications with functions	Solve problems involving application of linear equations.
Applications with data	Solve problems involving constructing and interpreting pie charts.

Source: Tennessee Department of Education (2014).

Some of those interviewed expressed concerns that standards and expectations associated with the Bridge Math course were too vague. Several respondents pointed out that while the goal of the course was to facilitate students' mastery of competencies set by the state, there was a lack of clarity about the nature of those competencies. According to one teacher, this led to weakened expectations for students.

In addition, respondents remarked on the absence of an exit exam or a way to know if students had become college-ready as a result of their participation in the course. Some teachers pointed out that the absence of the exit exam created flexibility in terms of course pacing, which allowed them to address student needs. Another was concerned about the lack of an exit exam, explaining,

Okay, we have no exit exam; there's no follow-up on the Bridge. And that's one of the downsides on the Bridge—the state program—is when you finished it, you are still back at “I need to get into college.”

Bridge Math students would need to receive a college-ready score on the ACT or place into college-level math on a placement test to be considered college-ready upon college entry.

Delivery of curriculum: The curriculum is delivered using a traditional lecture or direct instruction format. Instructors reported that the pedagogical emphasis in Bridge Math was on helping students to reinforce basic mathematical skills that would enable them to work in higher levels of math. One teacher indicated that she focused on mathematical concepts rather than procedures, as she felt that students with weak foundational skills lacked an understanding of the concepts that underlie certain procedures. While a course textbook was available, many teachers did not use it, or they used it to supplement materials that they created or organized themselves for the class.

According to some instructors, a critical factor in helping students build basic skills was the flexible pacing permitted in this course. Instructors appreciated having the ability to spend more time on content areas where students needed more help. One instructor stated, “I think pacing is really key—making sure students have had enough time to master concepts before moving on.”

Students with weaker foundational math skills appreciated the opportunity to review basic skills; however, more proficient students were bored by these topics. Because students in Bridge Math had a wide range of proficiency levels, instructors needed to use strategies to engage and teach students on both ends of the ability spectrum. As one teacher explained:

I get mixed feedback from the students because in some ways, some of the stuff that we do in here is so low-level. There are some pre-algebra concepts, and they kind of balk at that. They are like, “This is dumb; we have done this before.” Those students that are in here that don’t have that foundation will struggle with even the easy concepts. ... So I have to do a lot of differentiated instruction.

Tennessee’s Seamless Alignment and Integrated Learning Support Course

Description of curriculum: The Seamless Alignment and Integrated Learning Support (SAILS) curriculum covers essentially the same mathematical topics as the Bridge Math course, but it does so via five modules that correspond to the Tennessee Board of Regents’ developmental math online curriculum. The software used to deliver the SAILS curriculum is Pearson’s MyMathLab.

The modules, called Mathematics Learning Support (MLS) units, each contain a pretest, problem sets, applications of concepts, and a post-test. Students must master a specified set of learning competencies before moving on to the next module. Any modules that students successfully complete in high school do not have to be retaken in any Tennessee community college. See Table 10 for an overview of the content covered.

Unit	Topic
MLS 1	Real Number Sense and Operations
MLS 2	Operations with Algebraic Expressions
MLS 3	Analyze Graphs
MLS 4	Solve Equations
MLS 5	Modeling and Critical Thinking

Source: Chattanooga State Community College (2013).

We visited four high schools in Tennessee implementing the SAILS program as their senior-year transition math course. The curriculum was described by interviewees as focusing on basic or foundational skills in mathematics. One instructor said that the course “really just reinforces middle-school math, Algebra I, and a little bit of geometry. You know, it’s hitting the really basic skills that too many students don’t have.” Several instructors pointed out that many students in the SAILS course needed help with very basic concepts, such as “how to add and subtract fractions.”

Overall, those interviewed had positive reactions to the SAILS curriculum, especially the computer-mediated delivery of course content. Both instructors and administrators praised the alignment of the curriculum with college-ready expectations. As one instructor said, “So in SAILS, it is really what the community college tells us they want.” An administrator expanded on this point: “The alignment, particularly, with our state colleges ... is so seamless.” According to this administrator, there was no difference in terms of criteria for mastery between the high schools and colleges, and this made expectations for students very clear. Several schools in Tennessee offered students the chance to take dual enrollment math once they completed the transition course material.

Delivery of curriculum: Students’ time in the class is split between receiving direct instruction from a teacher and lab time, during which they use instructional software to complete problem sets, quizzes, and tests independently. Instructors decide how much time to devote to each modality. We observed a range of divisions of class and lab time, from classes primarily devoted to lecture to classes primarily focused on lab work.

The fact that the SAILS software supplies all lessons and exams helps to address the needs of students at different ability levels. One instructor noted that the software saved instructors time and allowed them to focus on pedagogy:

But it is nice at the same time that the curriculum is already developed and the assignments done so that—given the amount of time that I have to work with the students—I can really focus on kind of coaching them and facilitating their problem-solving journey towards getting all this stuff mastered.

The computer-mediated delivery of the curriculum allows students to move through material at their own pace and focus on areas where they encounter problems. This feature of the course was praised by an instructor:

The technology is extremely helpful because the way that it is set up is—let’s say they get a question wrong on their homework—they can click on a similar exercise like a thousand times if they want to until they finally get it right. I, as one instructor ... can’t do that individually to each student.

In other words, the delivery of the SAILS curriculum allows students to obtain as much assistance as they need to learn a concept, either within the software itself or by seeking help from the instructor.

However, we found some variation in respondents’ opinions of the course, depending mainly upon their attitude toward educational technology. Respondents who disliked using computers for learning expressed more negative feelings about the curriculum, and several instructors

found it difficult to help students as they worked on a wide variety of problems and modules. Some students enjoyed using computers in math class: “You have something to look forward to. Get on the computer instead of having to look at a book.” Others disliked that aspect of the course: “I don’t like computers. Don’t like doing math on it.” Another student expressed dissatisfaction with the self-paced nature of the course: “[The teacher] walks around a lot and helps us out as much as she can. But ... if there’s a ... question we haven’t gone over, it’s hard for her because each of us are on different modules or different questions.”

West Virginia’s English Transition Course

Description of curriculum: The course designated as the transition curriculum in English changed during the period that we conducted our research in West Virginia. The English 12 CR curriculum was originally developed to serve this purpose, and work was done to make sure it was closely aligned to West Virginia’s Next Generation Content Standards and Objectives for English. However, once implemented, it was determined to be more appropriate for students who were already on track to being college-ready. This meant that a different course would be needed for students who were in need of a transition course as defined in state legislation.

The English 12 CR curriculum, however, was offered as a transition course at the time of our site visits and is still taught in many West Virginia high schools. It is broken into 10 units, as shown in Table 11.

Unit	Title	Topic
Unit 1	Sentence Writing: Look to Your Future	Cover letter and personal mission statement
Unit 2	Paragraph Writing: Friend Me, Follow Me, Hire Me!	Focus on transitions in writing
Unit 3	Modes of Writing Part A: Tools for the Future	Write argumentative thesis
Unit 4	Modes of Writing Part B: Tools for the Future	Reading and writing in various genres
Unit 5	Essay Writing: Back to Your Future	Two-page informational essay
Unit 6	Literary Analysis Part A: Aren’t You a Shrewd One?	Text notation and summary
Unit 7	Literary Analysis Part B: Don’t Know Much About History	Literary works within a historical context
Unit 8	Research Writing: Past-Forward to the Future	Write abstracts of important historic texts
Unit 9	Community Service: Save the Future	Write a proposal for a community service project
Unit 10	Portfolio Presentation: The Real World	Summary of course work and reflection

Source: West Virginia Department of Education (2013).

A number of teachers we interviewed commented that the course’s flexibility allowed them to meet the needs of varied groups of students and to teach the course in their own style. The course had no official textbook, but course units were accessible to teachers online via West Virginia’s Teach21 website.

The course developed to replace English 12 CR as the state’s transition course is called Transition English for Seniors. According to state officials, work on the new course began in December 2013,

and full implementation started in the fall of 2014. In contrast to the unclear guidelines for student placement into the English 12 CR course, the placement guidelines for this course are very clear— all students who do not earn the benchmark score on the COMPASS placement exam in writing, administered in the middle of students’ junior year of high school, must take Transition English for Seniors. Students who take the course retake the COMPASS test at the end of the year, providing them with an opportunity to demonstrate college readiness.

The new Transition English for Seniors course standards are reflected in state policy (see Next Generation Content Standards and Objectives for English Language Arts in West Virginia Schools, 2014, p. 95). While teachers are able to choose how to teach the standards, they are encouraged to use materials from the Southern Regional Education Board’s (SREB) Literacy Ready course, available at no cost on the SREB website. Upon a review by state leadership, the SREB curriculum was found to adhere to all of the required state standards and to incorporate high-quality instructional activities. As one state policymaker commented on the SREB curriculum, “Teachers get more time to focus on the literacy skills that will carry over into anything students do. If implemented with fidelity and not considered ‘remedial,’ we’ll see a lot of success.” The units included in the Literacy Ready course, which includes content from history, science, and English, are shown in Table 12.

Disciplinary Area	Units
History	1. Civil rights with a focus on the freedom rides 2. U.S. foreign relations—Cuban Missile Crisis, Vietnam War, Six-Day War
Science	3. Nutrition 4. DNA and biotechnology
English	5. <i>The Shallows: What the Internet Is Doing to Our Brains</i> , by Nicholas Carr 6. <i>Ubik</i> , by Philip K. Dick

Source: Shanahan, Holschuh, and Rush (2013).

Delivery of curriculum: During our visits to West Virginia, we were only able to observe the English 12 CR course, as the Transition English for Seniors course was not yet developed. Many teachers reported that they adhered to the state standards for the English 12 CR course and worked to help students develop the specific skills dictated by those standards, but they did not necessarily use the curricular materials provided by the state. One instructor explained that many teachers were initially resistant to the idea of being required to follow a state-dictated curriculum, and were reassured when told that they could customize the materials as they saw fit.

In one school, the English 12 CR course was taught in an especially engaging way. The units were on topics of interest to students (e.g., drones, college costs). In the class we observed, the teacher was very active, walking up and down the center of the classroom and asking penetrating questions about the reading. Students were responsive and dug below the surface in trying to figure out what motivated different interpretations of the reading. The teacher later talked about how she tries to break students out of inertia in different ways, including having them write about their own lives (which she does as well) and then sharing their writing in dramatic readings. They regularly write one-page reflection papers addressing questions that she poses.

West Virginia's Math Transition Course

Description of curriculum: As with West Virginia's English transition course, there have been recent changes to the state's Transition Math for Seniors course. However, these were relatively minor, as the goal of the course has not changed. The course is designed to solidify students' quantitative literacy by enhancing numeracy and problem-solving skills. The changes were instituted primarily in order to align the course with the state's new Next Generation Content Standards. According to a state official, only relatively small changes were required to achieve the necessary alignment.

West Virginia's original Transition Math for Seniors course had three major content areas, with each containing 13–20 learning objectives aligned to the ACT College Readiness Benchmarks. The curriculum was created collaboratively by classroom teachers and college mathematics faculty at the request of state education leaders. The course objectives include performance descriptors used to assess whether students have attained a level of novice, partial mastery, mastery, or above mastery. In the sections that focus on Algebra I and Geometry, several instructors noted that the material is similar to ACT preparation curricula. Table 13 provides an overview of the content contained within each cluster.

Cluster	Topic	Examples of Learning Objective
1	Algebra I	Create and solve multi-step linear equations, absolute value equations, and linear inequalities in one variable (with and without technology); apply skills toward solving practical problems such as distance, mixtures, or motion and judge the reasonableness of solutions.
2	Algebra II	Factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes; analyze and describe the relationship between the factored form and the graphical representation.
3	Geometry/Trigonometry	Differentiate and apply inductive and deductive reasoning; justify conclusions in real-world settings.

Source: West Virginia Department of Education (2009).

Instructors generally structured their courses around the curricular materials provided on the Teach21 website. Several teachers expressed approval of the quality of the materials available on the website; for instance, one instructor remarked: "Oh, that website is awesome. Have you ever been on Teach21?" Another instructor was less enthusiastic, reporting that the curricular materials available on the website required supplementation.

Meanwhile, state leadership started looking at SREB's Math Ready course to determine whether to recommend the use of their curricular materials in the Transition Math for Seniors course. They found a high degree of alignment between the Math Ready course and the existing standards and transition course objectives, although there were some differences. The SREB course did not include trigonometry, and the Transition Math for Seniors course did not include statistics.

Following a conversation with state-level stakeholders, the state's leadership decided to encourage the use of the SREB Math Ready units in the Transition Math for Seniors course. In addition to viewing the Math Ready units as high-quality and well researched, they appreciated that the

curricular materials were widely available at no cost. Further, a determination was made that trigonometry was generally not needed for most students (those not entering majors in science, technology, engineering, and mathematics), while statistics was viewed as widely useful. The Math Ready units are shown in Table 14.

Table 14. Math Ready Course Curriculum

Unit	Topic
1	Exponentials
2	Quadratics
3	Equations
4	Measurements
5	Number operations
6	Systems
7	Linear functions
8	Statistics

Source: Barger (2013).

West Virginia plans to continue administering the COMPASS in the middle of the 11th grade and to use the results to place students into the Transition Math for Seniors course. Students who do not attain the benchmark score have the option of taking the transition course or a higher level math course.

A state leader, commenting on the use of the SREB curriculum, said: “I think it’s a wonderful course. I find that SREB ‘gets it.’ Our philosophies agree. It embodies the kind of teaching that’s in the Common Core; in each module, there’s a formative assessment. ... These lessons are awesomely built.”

Delivery of curriculum: During our interviews with Transition Math for Seniors teachers in West Virginia, many reported that they followed the state standards for the course but tweaked the curriculum in response to student needs or to improve upon lackluster lessons. Other teachers reported that they added hands-on activities to the curriculum to engage students and improve conceptual understanding. For example, one instructor stated:

And here is another activity I did. They had to come up with their own data with at least nine categories ... like the top 10 running backs, how many touchdowns, game one, game two. Then they had to make a histogram, bar graph, line graph, circle graph ... and there was the scavenger hunt.

Another instructor discussed emphasizing the concepts underpinning mathematical procedures throughout the course, which can be challenging for many students: “You always ask them why, why, why, or what, what, what. It’s always the *who* and the *why*, not the *what* and the *where*. ... It makes you go a little bit deeper. And for our kids, that’s new.”

In our observations at one school, there was an especially interesting lesson underway in a math transition course. The teacher had the class doing a review of basic algebra with a focus on order of operations; she had organized the review as a game that had students moving around the room. Students seemed engaged and were regularly encouraged to teach each other and work in groups. The

teacher commented that she worried that the transition math students needed review of middle-school math as well as more advanced math—she found that they got “bumped out of” the COMPASS test on the pre-algebra material and were then not able to show the algebra they knew. Consequently, she included a number of short reviews of middle-school math (fractions, percentages, etc.) in her instruction.

Cross-State Analysis

In each of the states included in this study, we studied two transition courses. California, New York City, and West Virginia offered transition courses in both mathematics and English; Tennessee, in contrast, offered two different courses in mathematics but none in English. Most of these courses were available statewide, with two exceptions: New York’s AHC course was offered only in New York City at the time of our study, and the EAP Senior Math course in California was offered in just one district. In this section, we discuss the overall trends in our findings.

Course Content, Format, and Goals

Curricular content: For the most part, the math transition courses were explicitly intended as a review of material that students had already encountered in high school math courses. At the same time, the courses varied somewhat in their emphases. While almost all courses included Algebra I content, there was considerable variation in the other topics covered. New York’s AHC course emphasized basic numeracy skills and arithmetic, aiming to ensure that students would be able to use math skills needed in daily life and understand the arithmetic concepts on college placement tests. The Tennessee Bridge Math course emphasized more advanced math topics from Algebra II and Geometry. The new West Virginia Math Ready units and California’s EAP Senior Math course included subjects less commonly taught in high schools, such as statistics or personal finance.

Another important goal of the math transition courses was to make sure that students continued their exposure to math in their 12th-grade year rather than abstaining from a fourth year of math. At the time of our study, Tennessee and West Virginia had just begun to require 12th-grade math for all students and needed a range of appropriate course options. One issue that arose in some settings was whether schools should be allowed to award high school credit for courses covering material already taught in earlier grades. In some states, this is considered acceptable (e.g., Tennessee); in others, it is debated (e.g., West Virginia).

We found that many of the transition math courses were designed to promote greater conceptual understanding rather than just procedural fluency, in alignment with research emphasizing the need to develop students’ conceptual thinking to prepare them for college-level math courses (Hiebert & Grouws, 2007). In the curriculum design process, many of the course developers were attentive to the idea that students should be able to use material and formulas learned to solve new and unfamiliar problems.

The English transition course curricula that we studied generally diverged from traditional 12th-grade English courses in British or American literature, although they were often well aligned with the Common Core State Standards, which place less emphasis on fiction reading. The courses often

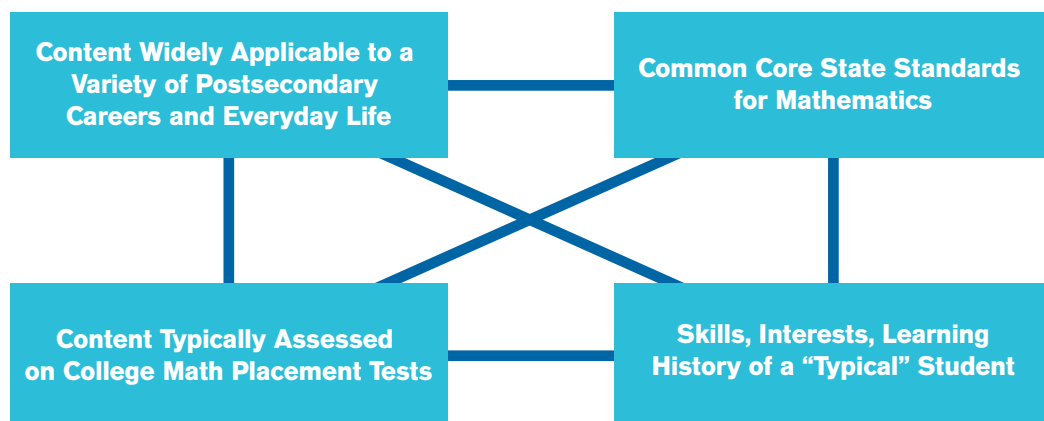
had students spend considerable time on analysis of current issues, deep reading of nonfiction texts, and formal writing, and sometimes exposed students to new fields of study, such as sociology and psychology (in New York) or history and science (in West Virginia). They aimed to be relevant to students, either by addressing topics that students cared about or by explicitly preparing them for college coursework.

There were cases where the course content required English teachers to teach in new ways. For example, in California and West Virginia, the English transition courses explicitly address current social issues and topics such as nutrition and youth criminal justice, requiring teachers to become familiar with this material. In addition, there was an expectation that students would engage with each other in group work and problem solving in all of the states, an approach that not all teachers had previously emphasized. A number of those interviewed considered the courses to be well aligned to emerging K-12 standards in English and thus in keeping with national trends in English instruction.

Multiple goals and demands: A number of states, high schools, colleges, and teachers were concerned about trying to address multiple, sometimes-competing goals with transition courses. Teachers often combined material from existing transition curricula focused on college readiness with material that addressed other goals, such as preparing students for specific assessments (e.g., Regents exams, the ACT), aligning course content with the curricula of other courses taught at the school (e.g., history courses), or increasing student engagement. Addressing multiple goals tended to mean that teachers struggled with decisions about what to prioritize and sometimes covered less of the official curricula.

In a number of states, there are differing opinions on whether transition courses are mainly for preparing students to pass placement exams or preparing them for college-level coursework (two goals that are not necessarily aligned—see the discussion in Barnett, Fay, Trimble, et al., 2013). For instance, during our study, discussions were underway about competing demands in New York State’s scale-up of transition courses. A CUNY representative developed the diagram shown in Figure 1 to depict these demands on New York’s AHC math course (shared by P. Coe, 2015).

Figure 1. Competing Demands of the Mathematics Transition Course



Perspectives on college readiness: During interviews, some stakeholders expressed the view that students are best served by a holistic curriculum that might not change their performance on a placement test but would prepare them for college-level courses. Others emphasized the importance of improving students' performance on college entry assessments, making it less likely that they would be assigned to remediation in college. In many cases, there was a desire to prepare students for both college-level work and entry assessments.

Some states' curricula contained clearer markers of college readiness than others. For example, Tennessee's SAILS curriculum was lauded by school stakeholders for its clear benchmarks for college readiness. As the SAILS curriculum is identical to the Tennessee Board of Regents' developmental education curriculum, students who complete course modules are considered college-ready in those content areas. In contrast, the AHC English curricula in New York City seemed to have a less clear standard of college readiness, as demonstrated by the range of ways instructors interpreted and implemented college-ready practices in their courses. It may be that when the goals and intended outcomes of the transition courses are too varied, the benchmarks of college readiness become less clear.

Curricular materials: The courses we studied utilized a variety of curricular materials. California's ERWC made all curricular materials available to instructors online and in paper format; instructors could access the material after participating in professional development to orient them to the course. New York's AHC courses had curriculum guides that contained course readings and activities for instructors and students. Tennessee's Bridge Math course had an official textbook created by the Tennessee Department of Education. The state's SAILS course curriculum, though not a text, was made available to instructors and students through computer software that provided all module content, activities, and assignments. Teachers in West Virginia were encouraged to use materials made available to the public on the SREB website.

Course delivery: Most of the courses were taught using traditional methods, via direct instruction in classrooms. Tennessee's SAILS course was the only course we studied that used a computer-mediated delivery model. At the same time, we observed a number of classes that used innovative and student-centered pedagogies. The English curricula in California, New York, and West Virginia were designed to engage students in discussion of current, thought-provoking issues and to provide them with opportunities to express their ideas verbally and in writing.

Across the four states, numerous stakeholders commented favorably on the flexibility of the curricula. Many instructors indicated that they appreciated the ability to select from or adapt the material they presented to students. Indeed, a number of teachers indicated that flexibility in pacing and choice of materials was essential to teaching students who had missed college-readiness benchmarks. At the same time, some course developers had established clear expectations and held teachers to them. The ERWC teachers were expected to teach a certain percentage of the units provided, and SAILS teachers were expected to use the online materials as provided.

Student Assessment

Part of ensuring student success in any course is to assess normal progress in mastering the knowledge and skills taught. With this in mind, we collected data on the ways students were assessed in their transition courses. Assessment, we found, varied significantly between math and English.

English assessment: We saw little formal testing in English. Generally, English teachers used a series of writing assignments or one large writing project to gauge students' progress toward mastering the course's content. Teachers who based the majority of the grade on large projects explained that it forced students to work harder and more deliberately, while teachers who relied on shorter, more frequent writing assessments argued that their students benefited from progressively more extended writing assignments that built up their skills. The students who were required to write a lot commonly spoke about how their writing had improved and how they were more comfortable with writing assignments.

Perhaps one of the reasons we saw little evidence of formal testing in English is because some teachers believed tests were harmful to student confidence. One teacher in West Virginia explained that her students did better without the pressure of exams:

Teachers are allowed to [administer tests or not]. I opted not to, just to see how it would work, and I found that they did better. There wasn't all the test anxiety. They realized that what they were working on had value.

Math assessment: There was considerable variation in how students were assessed in math. In California's EAP Senior Math course, teachers used traditional assessments to gauge students' mastery of skills, but they also included projects and student presentations of solutions to problems that required real-world applications of math. In West Virginia, the most common form of assessment was an in-class exam, and students generally expressed positive opinions about this type of assessment. The Tennessee SAILS program included the most distinctive type of assessment because of its structure. The online portion allowed students to progress at their own pace, and students could take tests when they were ready. As one Tennessee student explained:

And if you fail something, like I said, if you take a quiz and you make a 70 on the quiz, you can take it right then again. ... In a regular math class, a teacher would give you a quiz, and you could fail it, and then like three days later, they're like, "Hey, you failed this quiz." You've already probably forgotten how to do half that because you've already gone over two different topics in class.

From a teacher's perspective, the online testing also benefited students by providing them with simulations of the testing used in the college environment: "And another piece is the testing, the online testing is ... you can't talk. It's supposed to be monitored. The kids are supposed to come in and do it without talking, and it's a very structured environment."

Assessment for placement: Several of the courses had built-in mechanisms through which students could place out of developmental education while still in high school, either by completing and passing the course (in California and Tennessee) or by passing a placement

test (in New York and West Virginia). Table 15 shows the different mechanisms that allow students to place into college-level English or math.

	CA	NY	TN	WV
Math				
Students place out of developmental education by completing and passing course	X ^a		X ^b	
Students place out of developmental education by passing assessment		X		X
English				
Students place out of developmental education by completing and passing course	X ^c			
Students place out of developmental education by passing assessment		X		X

^aThis was only true for students attending Sierra College; students attending other colleges had to take the placement test where they matriculated.

^bSAILS only.

^cConditionally ready students only.

In other cases, students could not easily place into college-level English or math courses through participation in the course. Students who took Tennessee’s Bridge Math course were required to take a placement test when they enrolled in college. In West Virginia, not all students were aware that they could submit the scores from the COMPASS tests taken at the end of the course to the college they planned to attend.

Students in Transition Courses

Placement into transition math and English: In each state, students were required to take early college readiness assessments during their junior year of high school; their scores indicated whether they were on track to be ready for college-level coursework by the time they graduated. Students who fell below a state- or college-determined benchmark were the target transition course population. Generally, schools placed any student below the threshold into the course, not just students who were at the margin of college readiness.

In some cases, schools relied heavily on these assessment scores to place students into transition courses, while in other cases, students’ scores were used in conjunction with other metrics (e.g., teacher recommendations, student or teacher preferences). For some schools, the transition course was the default option for large groups of students. Tennessee is one example of a system that strictly uses test scores to place students. One Tennessee math teacher said, “If you make below a 19, you have to take Bridge Math. [If you have a 20,] they’ll put you in pre-calculus.” In contrast, a California counselor explained, “I don’t know if they told you, but every one of our seniors except for maybe a special ed student, all of the students are in the ERWC.”

Students did not always know why they were assigned to a transition course. Some students associated course enrollment with a low test score, but they were sometimes confused about what that score actually signified (i.e., testing below a college readiness benchmark). In New York, an AHC student admitted he was not aware of the program until he was automatically assigned to it: “I think it just showed up on my schedule. I wasn’t sure what it was until I went to the class.”

However, he learned afterwards that his placement into the course was due to his Regents score: “I’m in my English class because I got a 72 on my Regents, down by 3 points. ... Yeah, they can’t just let me slide for 3 points.”

Only in New York did we hear that schools could not accommodate every student who fell below the threshold due to the limited number of CUNY college placement test waivers available. Program administrators therefore gave priority to the students who were within 10 points of the threshold, offering students further below the threshold space after the first round of almost-ready students were enrolled. In some cases, teachers and counselors believed that limiting enrollment to students just below the readiness benchmark would be inappropriate; one teacher stated:

It seems kind of elitist to only target the students who are closer to ready. I think this type of structure and formal text analysis is good for all students. Even if the text is above them, there are still topics of conversation that they are going to be able to have something to say about. Maybe they might not meet all the goals of my course, but ... they are becoming citizens.

Other teachers argued that students on the cusp of college readiness were those who benefited the most. Almost-ready students often had many of the basic skills required for college-level English and math and would be the ones most likely to place out of remedial education.

Participating students: Transition courses in math and English are designed to increase college readiness and help students transition into college-level coursework. They also aim to strengthen students’ confidence and skills in a particular subject matter. Much of our evidence suggests that students enjoyed the transition courses they took, but it is difficult to know whether they enrolled with the goal of improving their likelihood of entering directly into college-level math and English. While some students were college-bound, many students who took transition math or English had either already decided on another path or were not sure if they intended to go to college. Many of the teachers we interviewed echoed this statement made by a Tennessee math teacher:

My understanding was that these were students who were not college-bound. ... None of them were. ... Some of them even had jobs already that they were ready to do, and so ... what I’ve been teaching them has not been preparing them for more college readiness, or for the ACT, even.

Some students enrolled in transition courses because they did not want to take the alternative math course. Some teachers pointed out that transition courses demanded less of students than Advanced Placement (AP) courses, and that they therefore attracted many students who did not want the extra challenge.

Placement practices often meant that the ability levels of students in transition courses ranged widely, from well above to well below the college-readiness benchmark. Some teachers struggled with the broad range of ability levels, while others thought the mix of high and low performers worked well because the students could benefit regardless of the level at which they entered. One teacher who espoused the latter viewpoint explained, “It helps the honors and AP kids because

they are writing, they are reading. ... It's helping my lower end students to build up to where they can actually benefit from a course like this and go into things.”

The courses were generally well received by the students in our focus groups, who often felt that there were advantages to taking transition courses. Many believed the transition course prepared them for college and increased the likelihood that they would avoid remediation. Some expected the courses to help them do well on high-stakes standardized exams, such as the SAT and the ACT. A number expressed eagerness to apply the skills they learned in the course in college-level coursework.

Teachers of Transition Courses

Teacher selection: Teachers chosen to teach transition courses in the schools we studied were fairly experienced (most had more than five years of teaching experience), and a number had sub-field specializations (e.g., credentials for both math and special education). However, in New York City, where the courses had a strong professional development component, we found that teachers who were less experienced but receptive to professional development were sometimes chosen to teach the course.

In addition, administrators frequently expressed an interest in assigning transition courses to teachers who knew how to relate to struggling students and how to develop their skills gently. One California administrator explained that she was pleased with the math teacher she had hired because of his unusual patience when working with students:

I've worked with teachers in the past who have taught upper level classes for so long that, if they teach a course like this, they tend to overlook students that struggle, or be condescending in some way without meaning to. And it undermines ... that confidence.

Students were more enthusiastic about transition courses when their teachers were patient and methodical and when they adjusted course pacing in response to student needs. One student from New York explained:

They just have a lot of patience with us. ... What I like best about these two classes is the teachers. They show that they care for you, and they support you throughout the whole journey. So they don't just leave you hanging without giving you a warning of whether you are failing or not.

Students also appreciated teachers with high expectations for them, believing, as is suggested by current research (Benner & Mistry, 2007), that they would do better when challenged. For example, one student praised a Bridge Math teacher for making students work hard:

You get homework almost every night. And then you've got a test, usually at the end of the week. That's probably one of the best teachers in this school. ... I do more work in his class than any of my other classes.

Professional development: In all of the states and locales studied, professional development was—or had been—available to prepare high school faculty to teach the transition courses. In California and New York, it was offered by colleges or college systems and partnering district and county offices, while in West Virginia, it was offered by the state’s K-12 Department of Education. At the time of our study, Tennessee was in transition. Professional development for the Bridge Math course had been offered by the state, but teacher support related to the SAILS model was offered by the college system. Only in New York was professional development offered to counselors as well as teachers, since they are expected to play a central role in running the program and teaching the courses. Table 16 summarizes the sources of professional development available in each state.

Table 16. Sources of Professional Development				
	CA	NY	TN	WV
Math				
Offered by state K-12 system			X ^a	X
Offered by college system	X	X	X ^b	
English				
Offered by state K-12 system				X
Offered by college system	X	X		

^a Bridge Math only.

^b SAILS only.

In some settings, the professional development offerings were highly formalized, while in others they were less structured. These differences may be partially attributable to the amount of time that the transition courses had been in place. For example, in California, the ERWC had been offered since 2008 (and piloted beginning in 2004) and included a well-developed professional development component with regularly updated online resources. In contrast, California’s EAP Senior Math course was relatively new, and its system for professional development was evolving.

The types and formats of the professional development offered in each setting varied substantially, as shown in Table 17. In all cases, we found that there was initial training offered to teachers on how to teach the course. In some settings, there were additional sessions offered throughout the year to allow teachers to discuss course implementation and teaching techniques and to learn from one another. Individual support was provided to implementing teachers in New York and in the Tennessee SAILS program, in alignment with research on professional development that highlights the effectiveness of extended training opportunities with explicit connections to classroom activities (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

Table 17. Structure of Professional Development

	CA	NY	TN	WV
Math				
Initial	X	X	X	X
Ongoing	X	X		
Individual support provided	X	X	X ^a	
English				
Initial	X	X		X
Ongoing		X		
Individual support provided		X		

^a SAILS only.

The main features of the professional development associated with each program were as follows:

- California:** The ERWC program has a well-structured professional development program that teachers must complete in order to gain access to the curriculum. It provides guidance on the required and optional aspects of the course, as well as pedagogical methods used in teaching the material. Professional development for the EAP Senior Math course has mostly involved regular group meetings and one-on-one guidance provided by a college math faculty member.
- New York:** AHC offered a two-day introductory workshop to all new teachers and counselors scheduled to teach a transition course. There were separate sessions for math teachers, English teachers, and counselors. All groups were provided with an introduction to the curriculum. In addition, counselors were provided with information on how to manage the CUNY placement testing—an integral part of the program. For the rest of the year, follow-up training sessions were offered monthly for about two hours per session.
- Tennessee:** Faculty teaching Tennessee’s Bridge Math program had been offered professional development by the state or by local districts when the course was originally offered, although not all were able to attend. Those involved with teaching the SAILS curriculum were provided with an initial orientation and ongoing support by a designated field staff person from the college, who assisted with all aspects of course implementation.
- West Virginia:** The state has periodically offered professional development for faculty teaching transition courses. These have been two-day sessions offered over the summer, mainly providing an overview of the curriculum units in each course and discussing course management and curricular materials. More recently, SREB has been involved in providing professional development during the summer to faculty wanting to use their material. There were considerable differences in teachers’ exposure to professional development based on whether it was required in order to teach the course (see Table 18) and ease of access. For instance, while New York’s AHC professional development was established and structured—and highly valued by those who attended—many of the teachers we interviewed did not regularly participate. They had varied reasons for not attending, mainly having to do with timing and competing priorities. Conversely, teachers in California’s ERWC were required to complete professional development in order to access course materials.

Table 18. Professional Development Participation Requirements				
	CA	NY	TN	WV
Math				
Required				
Optional	X	X	X	X
English				
Required	X			
Optional		X		X

Although delivery of and participation in professional development varied across programs, teachers generally appreciated the way it allowed them to interact with others teaching the same course. A New York teacher commented:

I think it’s good to interact with people who are in your same field so that, you know, sometimes it does make you challenge yourself a little bit more, you know? Or try something that you never thought that you would try.

Secondary–Postsecondary Collaboration

An important aspect of the transition course initiatives that we studied was the development or enhancement of partnerships between high schools and colleges. As discussed previously, transition courses in California, New York, and Tennessee were originally developed by the higher education sector as a way to help students enter college better prepared; in West Virginia, while the course originated in the K-12 sector, several faculty and administrators from the higher education sector played key roles as well. We encountered many examples of communication and collaboration across education sectors, although the mechanisms and intensity of collaboration varied. As shown in Table 19, there were four primary ways that higher education institutions have contributed to the implementation of transition courses.

Table 19. Higher Education Contributions				
	CA	NY	TN	WV
Math				
Participation in the development of courses	X	X	X	X
Curriculum, materials, and coordination	X	X	X ^a	
Professional development		X		
On-site assistance to classroom teachers	X	X	X ^a	
English				
Participation in the development of courses	X	X		X
Curriculum, materials, and coordination	X	X		
Professional development	X	X		
On-site assistance to classroom teachers		X		

^a SAILS only.

Through our interviews, we sought to understand the value of these partnerships to the parties involved. Several individuals in the higher education sector expressed an interest in increasing college enrollments. However, collaboration with the K-12 sector was primarily seen by the

postsecondary partners as a means to improve students' preparation, thus increasing the odds that they would succeed in college. One college staff member described how enrolling high school graduates who were better prepared might contribute to their academic progress:

If we can get kids coming in that are college-ready and they are taking their college algebra or college-level math and getting credit, [students will feel like] "I'm making progress and not getting bogged down and not getting frustrated."

High school administrators and faculty liked the idea that they were able to consult with colleges on what students should know and be able to do. They also valued the opportunity to expose students to college norms and expectations. One representative quote comes from a Tennessee counselor:

I think it empowers the kids. I think it encourages the kids. ... I mean, when they get to the Chattanooga State campus, they have a little bit of that leg up of at least knowing some people, knowing some terminology, knowing where offices are, that kind of stuff.

High school staff also appreciated the concrete resources and support offered by the college partners, particularly access to professional development and course materials. In many cases, colleges offered continued support and on-site assistance to high schools. As one AHC English teacher described:

When it was the first time I was teaching the sociology part of it, and I was stuck ... I just emailed [the program officer]. She emailed me right back and ... so that was clarified, and I just moved forward.

In California, implementation of the EAP Senior Math course was closely monitored by a grant-funded member of the college math faculty. This faculty member provided ongoing consultation and assistance to individual faculty members who needed help with implementation. One teacher described her role as follows:

Her role has been to come in to help with instruction, to coach us, to answer our questions online. She developed some assessments for us. She has made changes to the curriculum when we've written in and said, "This needs changing."

In Tennessee, schools participating in the SAILS program received considerable on-site assistance. Each was assigned a field representative from a local community college who was able to assist with issues related to math content and the use of the online technology. Teachers felt that they had ready access to support when they needed it and commented on the responsiveness of the college representatives.

Factors Affecting Implementation

The implementation of any new initiative may be affected by a series of facilitators and hindrances. We inquired about what factors aided or impeded the implementation of transition curricula at each of the schools. Individuals indicated that a culture of innovation, teacher and administrator buy-in, and collaboration with external partners were instrumental to effective implementation.

However, implementation was sometimes impaired by lack of student engagement, delays in test score receipt, insufficient funding, and lack of access to data on student outcomes.

Facilitators

Culture of innovation and caring: Teachers, administrators, and counselors often cited a culture of innovation as one of the key ingredients for effective implementation of transition curricula. One California administrator attributed the success of the course to the staff and leadership’s willingness to try new approaches to improving student outcomes:

I think the great majority of the staff here will say, “Yes, let’s try it.” And then they will reflect and analyze whatever the movement is, especially if it’s good for kids, before they say, “We are going to resist and see if it dies out.” There is a natural willingness to get on board with things.

Similarly, a math teacher from another school reported that success hinged on a willingness to try something new, even if it may fail: “We love trying new things. This is a school that has no problem with saying, ‘Why not?’ This is a school that has never been content with ‘This is how we have always done it.’”

Another aspect of institutional culture that some respondents considered important had to do with shared intentions and caring, as described here:

[We] work very closely together, and everybody has good intentions. I mean, even on the CUNY side of it, too. I mean, everybody’s intentions are good and positive and caring, as far as what the kids need to move forward.

Teacher and administrator buy-in: Teacher and administrator buy-in played an important part in establishing a positive foundation for transition courses. Here, the term “buy-in” means that there was a commitment to learning about the course, understanding its goals, and trying out different strategies to achieve the goals, and a belief that the course benefits students. A number of teachers and school leaders highlighted this point when asked about what facilitated course implementation. For example, one instructor said: “I think teacher buy-in is always the biggest thing, making sure that we really care about the curriculum, and that we really care about the outcomes. That’s probably the most important thing.”

Another spoke of the importance of commitment from the school’s administration:

You have to have a principal who believes in the program, who is on board. Because if he doesn’t dedicate a teacher to the class, the class won’t happen. ... If you have an administration that’s on board, teachers are more than happy to go along and do the same.

Collaboration with external partners: When strong communication and collaboration with external partners was present, teachers and administrators often cited this relationship as a factor in the course’s success. Various teachers and administrators described how implementation was

enhanced through relationships with district employees, community organizations, or the local college. One teacher expressed her appreciation for the professional development providers from higher education: “I think that they help to foster [buy-in]. And they really are always there to help us, to always give us great feedback, and obviously for professional development. So, I think that’s a huge part of it, for sure.”

Hindrances

Lack of student engagement: Perhaps the most commonly mentioned hindrance to effective implementation was the lack of student engagement, explanations for which varied. Some interviewees thought it was because students were seniors and wanted to have an easy year:

The limitation is kids believe that they deserve an easy senior year. ... It’s a tough sell to get kids to take math, foreign language, and science their senior year. Of those three, science is the most likely choice of kids, if they are going to do the rigorous senior year.

This principal may have been correct because some students admitted to having low levels of motivation when choosing not to take advanced or more challenging courses. However, many teachers, such as the teacher from West Virginia quoted below, were concerned that student apathy extended beyond senioritis and instead was indicative of a more deeply entrenched social problem:

There are many kids that are in this lower level that are just as smart as [others], but there are more of them who don’t want to come to school, who don’t want to do school, who don’t want to do the work, that are behavior problems. ... And I need them to do work. I need them to produce something, and employers need that, too. That’s where we really need to focus on these kids more.

Delays in test score receipt: Delayed receipt of test scores created issues for course scheduling in several states, with scores often arriving just at the start of the fall semester. By this time, counselors and students typically had already decided on a schedule, and making changes was difficult. One counselor from West Virginia described the problem to us:

It’s difficult because we do not get the WestTest scores back until very close to the beginning of school. The kids have the opportunity to make their schedule at the end of the previous school year. And then when we actually get the scores, you know, it’s overloaded, because we have to put those kids in there.

Late scores also caused delays in instruction, as explained by this California teacher:

When the class started, we hadn’t got the EAP scores. California was late releasing them. So, we only had four kids in the class. We started the year about three or four weeks late because of waiting for the EAP scores.

Insufficient funding: Many respondents indicated the biggest obstacle to implementation was insufficient funding. Budget constraints affected the schools’ ability to hire more teachers, as well

as the ability of higher education organizations to provide professional development or support. For example, a New York counselor said, “I don’t know if we can budgetarily afford to run another elective math class, but I think it’s more of a budget issue than finding a teacher that would be willing to teach the class.”

Lack of data on college outcomes: Many of our respondents wanted to know if the transition courses were effective; they also wanted to be able to make changes that would improve the course. However, they were discouraged by inadequate access to data on students’ subsequent college performance. One of our interviewees explained:

I don’t think we’ve gone a full four years to really see if that graduation rate, on-time graduation, has improved. And the other thing is, we never get it back. We don’t know. The word of mouth whether this kid made it or that kid made it. You know, we don’t see that data.

In Tennessee, Bridge Math teachers and administrators took issue with the fact they had no affirmation that their course was effective. One commented, “Nobody knows if we’re meeting [state standards] or not meeting them. We have no exit exam. There’s no follow-up on the Bridge.”

Conclusion

Summary of Findings

There is broad agreement that too many students require remediation in college, depleting scarce resources and reducing college graduation rates. It is also widely agreed that helping students to master the literacy and numeracy skills required for college while still in high school is the best way to reduce the need for remediation. Transition courses are one method by which high schools are working to better prepare their students, offering up to one full year of support in math or English. Despite the promise of these courses, however, there has been little in-depth analysis of what transition courses look like in practice and how they work to improve the college transition; the current project addresses that gap in the literature.

We employed a qualitative research design, relying on semi-structured interviews, classroom observations, and a review of associated documents to capture the varied ways in which schools in California, New York, Tennessee, and West Virginia implemented transition courses. We examined the courses and the ways teachers interpreted and taught them in their own classrooms. The curricula and implementation varied significantly among states, but the teachers generally had the same goals in mind. The courses were principally designed to review and reinforce materials students had already been exposed to. Teachers wanted students to be adequately prepared for college-level coursework and to be successful at practical math, reading, and writing requirements in the workplace. Some of the curricula were more formalized and prescriptive, while others permitted greater flexibility and decision making by individual teachers. For example, West Virginia did not mandate a specific curriculum, while the Tennessee SAILS course was almost completely structured around online learning modules.

Professional development played an important role in shaping the implementation of the courses, although the types offered varied considerably. New York's At Home in College program had an ongoing, structured professional development program, although not all faculty participated. California required teachers to attend initial professional development sessions and participate in ongoing training, and in the case of the ERWC, obtaining access to the curriculum required participation in professional development. Tennessee's SAILS program only required initial training but offered individual support. Professional development with strong opportunities for collaboration with other teachers was particularly well received.

Interviews with teachers and students, supplemented by classroom observations, helped shape our image of what the classroom experience was like and how it evolved. Most teachers had substantial teaching experience and demonstrated a passion for helping students learn the foundations of math and English. In some cases, teachers were so committed to the course that they became its champions, ensuring that it became incorporated into the fabric of the school. Other teachers were less enthusiastic about the course, wishing for more rigor, more motivated students, or a different approach to preparing students for college.

Students valued their teachers' patience and high expectations. At the same time, many were not initially aware of why they were placed in the course in the first place, and it was only after the course started that students learned the reason for their placement. Though the course was designed to reduce the need for remediation in college, some of the students who took the course did not expect to go to college. Still, college-bound students were common in our study, and many voiced their appreciation for the opportunity to develop the skills required for strong performance in college.

Through our study, we also identified several conditions that facilitated or hindered course implementation. Not surprisingly, schools that fostered a culture of innovation appeared able to implement new transition courses more easily. In many cases, strong implementation occurred when there was a champion for the course or a number of people with a strong sense of buy-in. People who were involved in developing the course or who benefited from high-quality professional development generally felt invested in the course. In addition, buy-in was enhanced by strong ties between implementing schools and their college partners or professional development organizations.

The barriers to implementation and success tended to center around structural or administrative issues, and sometimes lack of student engagement. The late arrival of test scores complicated the process of assigning students to transition courses. The lack of data on students' college outcomes also made it difficult for high schools to make meaningful adjustments to the course. In some schools, budget constraints made it difficult to hire enough teachers and to provide enough classrooms for the number of students who qualified to take the course; this was an especially prominent problem in New York City. Finally, some stakeholders were concerned when there was no explicit mechanism for students to place out of remedial education in college through the course.

Implications for Stakeholders

Our study raises a number of issues that stakeholders at the state and local levels may wish to consider when implementing transition courses. Some of these were discussed in our prior publication, including the need for strong collaboration between the K-12 and higher education sectors; the need to consider competing priorities regarding the courses' goals, content, and governance; the importance of state-level commitment to improving college readiness; and the need for further research on transition courses (Barnett, Fay, Trimble, et al., 2013). Other issues, discussed below, include the college-for-all movement, varying definitions of college readiness, work on student engagement, course content for transition courses in math, and secondary–postsecondary collaboration.

The College-for-All Movement

There is an increasing focus on ensuring that all students graduate high school ready for college. But it is especially difficult for high schools to implement programs that sufficiently boost the skills of the least prepared students, who often graduate high school without plans to attend college, although many of them ultimately do enroll. While transition courses are most often targeted

to those in the academic middle, many are taken by lower (and higher) performing students. When this occurs, there are several questions that must be addressed:

- What is the best approach to teaching students with a broad range of ability levels? Is it better to differentiate instruction to meet the needs of all students who are struggling, or is better to attend to their needs in separate courses?
- Should the goal of transition courses be to prepare all students for college-level work, or should career readiness also be an explicit focus? Many education leaders consider college and career readiness to be virtually the same (see, e.g., Conley, 2012). However, this is widely questioned in relation to topics such as algebra, for example, which is a major focus of most math transition courses. Traditional, college-level algebra is increasingly seen by some reformers as unnecessary for college and career paths that are not STEM-focused (Cullinane & Treisman, 2010; Hacker, 2012).

Different Definitions of College Readiness

A related issue is the presence of different definitions of college readiness that are not always aligned. These differences are driven by the fact that there are three entities which generate definitions: the K-12 system, colleges, and standardized tests. K-12 system definitions are typically guided by state standards (including the Common Core State Standards) and by the views of teachers in the context of their disciplinary discussions. Colleges' views of college readiness are guided by faculty, dominated by math and English departments. College placement tests are broadly used measures of readiness in math and English; they are somewhat aligned with college faculty members' views of readiness. In addition, the ACT and the SAT embody their own views of college readiness, informed by studies of the knowledge and skills that correlate with student success in college. Given these varying definitions, transition course developers should consider the following questions:

- Which version of college readiness should form the basis of transition courses? It is important to note that college faculty members' involvement in curriculum development does not guarantee that students who complete the course will be prepared to pass college placement exams.
- Should students be able to place into college-level coursework upon completion of the course? If this is a desired outcome, a mechanism is required for this to happen. Either a placement test should be administered at the end of the course (as in New York and West Virginia), or completion of the course should be considered a valid indicator of college readiness (as in Tennessee's SAILS course).

Engaging Seniors

High school students commonly become less engaged in schoolwork during their senior year (Hoover, 2003). Some may have been accepted to college and wish to take it easy; college-bound students may be unaware that developmental education in college can hold them back. Others do not expect to go to college, although they may find themselves doing so at some point in their lives. Can transition courses help increase students' engagement? A number of these courses, especially

in English, work to increase motivation by dealing with current issues of importance to youth. In other cases, transition course teachers impress upon students the importance of placing out of remedial education in college. Those developing transition courses might wish to explicitly work to engage students by addressing these questions:

- Can incentives for participating in transition courses be built in? Can mechanisms be put in place to make sure students completing courses are placed into college-level coursework and/or offered the chance to take dual enrollment courses?
- Are there ways to connect transition course curricula to issues of current or future concern to students?

Repeating Lower Level Material in Math

Transition math courses tend to be taken by students who have completed at least Algebra II but have not mastered it; in fact, they often need reviews of Algebra I material as well as arithmetic. Giving students multiple chances to work with key math concepts is thought by some researchers to be a useful educational practice (Dempster, 1989; Roher, 2007), allowing them to understand the material more deeply before progressing to college-level math. However, the repetition of lower level math material in transition courses raises the following questions:

- Should students be awarded credit for a course that covers material that they have already been exposed to—and for which they were previously awarded credit? This was permitted in most of the states we studied but was not universally the case.
- Should students be encouraged to take the highest level of math they could possibly manage? Or is better to make sure that students have a deep understanding of fundamental math principles?

Secondary–Postsecondary Collaboration Issues

We encountered different levels and types of collaboration between high schools and colleges, each of which had advantages and disadvantages. In some cases, most of the collaboration took place at the time of curriculum development (e.g., Tennessee’s Bridge Math course and West Virginia’s transition courses). In one case, there was ongoing, collaborative development and refinement of the curriculum (e.g., California’s EAP Math for Seniors course). In other settings, the curriculum was developed by the postsecondary system, which then offered professional development and ongoing support to schools (e.g., California’s ERWC, New York’s AHC courses, and Tennessee’s SAILS course). In considering what level of collaboration is ideal, stakeholders may wish to consider the following issues:

- Do the costs of greater collaboration match the benefits? Clearly, there are advantages to ongoing interactions between the K-12 and postsecondary sectors. With more interaction comes a greater understanding of the curriculum, pedagogy, norms, and challenges of the other institution. In addition, these collaborations become the basis for shared ownership of the initiative and a commitment to seeing it succeed.

- On the other hand, costs increase with added time devoted to collaborative activities. In the settings with little ongoing collaboration, there are relatively low costs associated with offering transition courses, which become regular senior-year courses offered under existing funding streams. Closer collaboration requires a budget beyond that normally available from existing funding sources, especially to cover the costs incurred by colleges.

Final Thoughts

Transition courses hold promise as a way to help students finish high school ready to undertake college-level coursework, as explicitly defined by higher education institutions. They have the potential to play a big role in making the senior year a valuable on-ramp to college success, rather than a year for students to coast. Further, they are generally low in cost, and most of the associated expenses can be covered by existing funding streams. However, much is still unknown about transition courses, including: (1) the extent to which they improve college outcomes and (2) their optimal designs, given local priorities and student needs. More research in these areas is needed in order to determine whether and how transition courses are providing the intended benefits to students. (A future CCRC report will present findings on the impact of transition courses in New York City and West Virginia.) Nonetheless, the implementation of transition courses in California, New York, Tennessee, and West Virginia, as described here, illustrates that some K-12 systems and colleges are now engaged in significant efforts to better prepare high school seniors for college. If these efforts are successful, they will serve to improve alignment between secondary and postsecondary education institutions.

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Appendix: Study Methods

We analyzed the implementation of transition curricula in four states: California, New York, Tennessee, and West Virginia. We conducted full-day site visits at four schools in California, New York, and West Virginia and six schools in Tennessee, during which we conducted interviews and focus groups, observed classes, collected relevant documents, and toured school facilities. In total, we conducted more than 80 interviews, with one or more people participating, across all four states (see Table A1 for details).

	CA	NY	TN	WV	Total
Administrators	4	5	5	4	18
Counselors	4	5	5	4	18
Department heads				2	2
English teachers	1	4		5	10
Math teachers	4	1	9	4	18
Student focus groups	4	4	5	4	17
Total interviews	17	19	24	23	83
Total schools	4	4	6	4	18

We used a set of semi-structured interview protocols that were designed to identify important aspects of course implementation, including the courses' origins, goals, curricula as designed, delivery of curricula, student assessment, student placement, teacher selection and roles, facilitators, and obstacles. Interviews with administrators, faculty, and counselors were typically conducted on an individual basis, while we used focus groups to collect feedback from students. Interviews usually lasted between 30 and 60 minutes and were conducted by two members of the research team (see Table A2 for an example of site visit activities).

Time	Activity	Person/Room
8:30–9:00 a.m.	Interview principal and provide overview of study (30–45 minutes)	XXX
9:15–9:45 a.m.	Observe English course (30 minutes)	XXX
10:00–11:00 a.m.	Interview English course instructor (1 hour)	XXX
11:00 a.m.–12:00 p.m.	Student focus group of 5–7 students (1 hour)	XXX
12:00–1:00 p.m.	Observe math course (1 hour)	XXX
1:00–2:00 p.m.	Interview math teacher (1 hour)	XXX
2:00–3:00 p.m.	Interview school counselor (1 hour)	XXX

Our interviews were transcribed and then analyzed using ATLAS.ti qualitative software. We created a coding scheme to guide our research; this coding scheme was adjusted as major themes emerged. We relied on a combination of grounded and open coding to identify some of the major patterns regarding (1) the unique structures of the curricula, (2) differences and similarities in curricula, (3) how students are placed into transition curricula, (4) the types of students participating in transition curricula, (5) how students and teachers respond to transition math and English courses, and (6) what features or conditions facilitate or inhibit successful implementation of transition curricula.

Additionally, we drew on school documents and publicly available documentation (e.g., state and district websites) to triangulate our findings, and checked for inter-rater reliability by systematically reviewing coding and doing coding checks where two or more researchers coded the same transcript.

Prior to this study, we conducted a national scan to determine which states offer transition courses. Eight states at the time had statewide transition curriculum initiatives, 21 states had local rather than statewide initiatives, and nine states were in the process of considering the use of transition curricula.

We selected California, New York City, Tennessee and West Virginia as sites for this research because they offered transition curricula that were established and widely implemented. Additionally, the states are geographically, politically, and economically diverse. These differences enabled important comparisons and contrasts. For example, West Virginia has a highly centralized education system, while California is considerably more decentralized. The states' geographical differences enabled us to learn about implementation in contrasting environments ranging from a large, urban center such as New York City to a largely rural state such as West Virginia.

The schools we visited were recommended by district- or state-level contacts involved with the original development of transition course initiatives. They were selected as schools that had attempted to implement the courses well; had implemented a math or English transition course for at least one year; offered some type of professional development for staff and administrators; and, when possible, offered both math and English transition courses. The schools in our study were diverse and proffered rich opportunities for study of implementation in varied settings.



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