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Building Guided Pathways to Community College Student Success

Promising Practices and Early Evidence From Tennessee

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The Community College Research Center (CCRC), Teachers College, Columbia University, has been a leader in the field of community college research and reform for over 20 years. Our work provides a foundation for innovations in policy and practice that help give every community college student the best chance of success.

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Among state community college systems, the Tennessee Board of Regents is probably the furthest along in implementing guided pathways reforms.

Inside This Report

Among state community college systems, the Tennessee Board of Regents (TBR) is probably the furthest along in implementing guided pathways reforms. All 13 Tennessee community colleges are reforming their programs, policies, and processes to better help students choose, enter, navigate, and complete programs in fields of interest to them and to ensure that these programs prepare students to advance in the labor market and pursue further education at the bachelor's level and beyond. By implementing "Tennessee completion practices" that reflect the guided pathways model across multiple areas of the student experience simultaneously, the colleges are strengthening support for students throughout their entire college pathway. This report provides insight into how the 13 Tennessee community colleges are operationalizing the completion practices in their own contexts, as well as how trends in leading indicators of student completion have changed since the reforms began.

Drawing on colleges' detailed self-assessments of their progress and telephone interviews with college administrators, staff, and faculty from all 13 colleges, we first describe how far along the Tennessee colleges are in implementing completion practices. Under each of the four major areas of guided pathways reforms, we highlight particular practices of interest to the field:

1. **Mapping pathways to student end goals.** To help students understand their college and career options and plan how they will achieve their goals, the Tennessee community colleges are beginning with the end in mind, starting with students' goals for careers and further education and backward mapping educational paths to those goals. For this area, we highlight the colleges' work on mapping programs of study that lead to transfer and career opportunities and developing math pathways that are aligned with these programs.
2. **Helping students choose and enter a program pathway.** To help students make informed program choices and develop completion plans, the Tennessee community colleges are fully redesigning their new student intake processes to facilitate career and academic exploration and emphasize early educational planning. The colleges are also working to integrate contextualized academic support into program gateway courses so that students can complete these courses in their first year and proceed with more specialized coursework in their field of interest. We highlight how the colleges are helping students explore their career and program options; make personalized, full-program degree-completion plans; and complete college-level math and English in their first year through corequisite academic support in math, reading, and writing.
3. **Keeping students on path.** Many Tennessee community colleges are redesigning their advising systems so that student progress monitoring occurs more proactively and systematically and that student supports are strategically deployed to address students' individual needs. For this area, we highlight work the colleges are doing to redesign their advising structures and processes, develop systems that allow

both students and advisors to monitor student progress, implement degree-audit and early-alert systems, redirect students from limited-access programs when necessary, and schedule courses in a way that better supports students' progress through their programs.

- 4. Ensuring that students are learning.** As the Tennessee community colleges enhance the alignment of their programs with careers and further education, they are seeking to ensure that their programs provide students with rich learning experiences that prepare them for their post-community college pursuits. We describe how the colleges are assessing program learning outcomes and using them to improve program review and professional development. We also discuss how they are improving teaching and learning across program pathways by providing active learning opportunities and encouraging students to reflect on, convey, and transfer what they have learned as they approach program completion.

We then examine promising trends in first-year momentum among entering students, with a focus on students' accumulation of college credits and completion of gateway college math and English courses in their first year. CCRC calculated these metrics using unit record data shared by TBR for fall cohorts of first-time-ever-in-college students from 2010 through 2016. Since a fundamental goal of Tennessee's completion efforts and related guided pathways reforms is to close equity gaps, we examine not only overall improvements in early momentum metrics across cohorts but also to what extent colleges have made progress in closing equity gaps by race/ethnicity and age.

Finally, we consider critical next frontiers for the Tennessee community colleges, including their efforts to better support returning adult learners and to help students explore career and college options while they are still in high school. We also discuss future directions for CCRC's continuing research partnership with TBR and the Tennessee community colleges.

Introduction

In recent years, Tennessee has received national attention for its Tennessee Promise scholarship program, which covers tuition for two years at the state’s community and technical colleges for recent high school graduates, and its Tennessee Reconnect legislation, which promotes access to community and technical colleges among adults. Less publicized but equally noteworthy are the efforts by the state’s community colleges to help more students complete college credentials of value. Spurred by the 2010 Complete College Tennessee Act and the Drive to 55 initiative (whose goal is to increase the share of Tennesseans with a college credential to 55 percent by the year 2025), Tennessee’s 13 community colleges, with leadership from the Tennessee Board of Regents (TBR), have implemented an impressive array of reforms aimed at improving student persistence and success.

The Tennessee community colleges are reforming their programs, policies, and processes to better help students choose, enter, navigate, and complete programs of interest to them and to ensure that these programs prepare students to advance in the labor market and pursue further education at the bachelor’s level and beyond. The colleges call the core elements of their approach “Tennessee completion practices”—but they are essentially what the Community College Research Center (CCRC) and many others in the field call “guided pathways practices” (Bailey, Jaggars, & Jenkins, 2015; Jenkins, Lahr, Fink, & Ganga, 2018). The similarity between Tennessee completion practices and guided pathways practices is no coincidence. In fact, CCRC’s guided pathways model was developed partly through our research in Tennessee (through a Lumina Foundation–funded project involving TBR and Complete College America). CCRC encourages states and colleges to adapt the guided pathways framework to their contexts and goals (Lahr, 2018), and we worked with TBR to customize the framework to include certain practices that are specific to Tennessee, such as degree-completion plans, work with adult students, and high-impact practices. Figure 1 shows the Tennessee completion practices, which are grouped under the four major areas of guided pathways practice: mapping pathways to student end goals, helping students choose and enter a program pathway, keeping students on path, and ensuring that students are learning.



By implementing multiple complementary reforms concurrently, the colleges have been able to impact many parts of the student experience.

Among state community college systems, TBR is probably the furthest along in implementing guided pathways reforms. The 13 Tennessee community colleges have implemented guided pathways practices from each of the four major reform areas at an impressive scale. By implementing multiple complementary reforms concurrently, the colleges have been able to impact many parts of the student experience and support students throughout their pathway through college. This contrasts with the piecemeal, fragmented way that community colleges often approach reforms intended to improve student outcomes.

Figure 1
Tennessee Completion Practices

1 Mapping Pathways to Student End Goals

- 1a. All programs—including both career-technical (AAS and technical certificates) and transfer programs—are well designed to guide and prepare students to enter employment and further education in fields of importance to the college's service area.
- 1b. Detailed information is provided on the college's website on the employment and further education opportunities targeted by each program.
- 1c. Programs are clearly mapped out for students. Students know which courses they should take and in what sequence. Courses critical for success in each program and other key progress milestones are clearly identified. All this information is easily accessible on the college's website.
- 1d. Required math courses are appropriately aligned with the student's academic focus area.

2 Helping Students Choose and Enter a Program Pathway

- 2a. Every new student is helped to explore career and college options, and to choose an academic focus area and program that best aligns with the student's interests and aptitudes.
- 2b. All students are helped to build a full-program personal degree-completion plan that incorporates the following milestones in Year 1: three courses in their focus area; college-level English (6 hours) and mathematics (3 hours); and a schedule with as many credits as each student can take.
- 2c. Poorly prepared students are provided with corequisite support to help them succeed in college-level math and English courses.
- 2d. Special supports are provided to help students succeed in the "gateway" courses in each academic focus area (in addition to college-level math and English).
- 2e. Intensive support is provided to help very poorly prepared students to succeed in college-level courses as soon as possible (i.e., for those students not ready for corequisite courses).
- 2f. The college works with high schools and other feeders, such as the Tennessee Reconnect Communities and Veterans Affairs, to motivate and prepare students to enter college-level coursework in a program of study when they enroll in college.

3 Keeping Students on Path

- 3a. Advisors monitor which program every student is in and how far along the student is toward completing the program requirements.
- 3b. Students can easily see how far they have come and what they need to do to complete their program.
- 3c. Students receive ongoing advisement in their academic program, and advisors and students are alerted when students are at risk of falling off their program plan. The college has policies and supports in place to intervene in ways that help students get back on track.
- 3d. Assistance is provided to students who are unlikely to be accepted into limited-access programs, such as nursing, to redirect them to another more viable path to credentials and a career that aligns with their interests, academic progress to date, and potential for success.
- 3e. The college schedules courses to ensure students can take the courses they need when they need them, can plan their lives around school from one term to the next, and can complete their program in as short a time as possible.

4 Ensuring That Students Are Learning

- 4a. Program learning outcomes are aligned with the requirements for success in the further education and employment outcomes targeted by each program.
- 4b. Students have ample opportunity to apply and deepen knowledge and skills through projects, internships, co-ops, clinical placements, group projects outside of class, service learning, study abroad, and other TBR High Impact Practices that program faculty intentionally embed into coursework.
- 4c. Faculty assess whether students are mastering learning outcomes and building skills across each program, in both University Parallel [transfer-oriented] and career-technical programs.
- 4d. Results of learning outcomes assessments are used to improve teaching and learning through program review, professional development, and other intentional campus efforts.
- 4e. The college helps students document their learning for employers and universities through portfolios and other means beyond transcripts.

For example, many community colleges nationally have begun reforming their math offerings and requirements, implementing multiple measures for course placement, corequisite courses and other course structures that accelerate students' progress into college-level courses, and alternatives to algebra for students who do not intend to enter science, technology, engineering, and mathematics (STEM) programs. Used together, these practices have shown great promise in substantially improving the rates at which students take and complete college-level math in their first year—yet most colleges have not implemented these practices at scale and in concert with one another (Rutschow & Mayer, 2018). Most math remediation in community colleges is still delivered through multiple levels of prerequisite courses despite growing evidence in favor of a corequisite model, where students enroll directly in a college-level math course with integrated and contextualized academic support. Moreover, many colleges have developed multiple pathways in math beyond the conventional algebra–calculus sequence, creating course offerings that focus on statistics and quantitative reasoning skills that are more applicable to social and behavioral sciences, arts and humanities, business, nursing, and other fields outside STEM. However, community college developmental education courses are still typically focused on algebra, and program requirements and advising practices at most community colleges still place most students into the conventional algebra–calculus pathway by default (Rutschow & Mayer, 2018).

The Tennessee community colleges, in contrast, have redesigned their math offerings to incorporate both corequisite remediation and math pathways, and they have done so in coordination with reforms to program maps and new student advising. Faculty and advisors have identified the most suitable math pathway for each program, and students are helped to explore career and academic options and choose a program early on, enabling advisors to guide them to the appropriate math pathway. Rather than requiring all students who need additional academic support to succeed in college-level math to take remedial algebra courses, the Tennessee community colleges have most of these students enroll directly in college-level courses coupled with corequisite academic support courses designed for the particular college-level math course. In this way, the reforms operate together so that all entering students are guided to take math that is appropriate for their program of interest and are provided with needed academic support customized to their math pathway. The Tennessee community colleges are among the first in the country to combine these practices and implement them at scale for all degree-seeking students. We believe that they have been able to do so precisely because they have implemented these practices in concert with one another.



The Tennessee community colleges have redesigned their math offerings to incorporate both corequisite remediation and math pathways, and they have done so in coordination with reforms to program maps and new student advising.

This report describes efforts by the 13 Tennessee community colleges, with support from the TBR system office, to implement guided pathways practices, or what in Tennessee are referred to as “completion practices.” (Throughout the remainder of the report, we refer to them using the latter term.) Although the colleges acknowledge that they still have a long way to go, they are far enough along in implementing these

practices that we can begin to examine the early effects of the reforms on student success. In this report, we present some promising trends among Tennessee community colleges in early momentum metrics, which research by CCRC and others suggests are leading indicators of increased completion rates over a longer time frame.

The remainder of the report is organized as follows: In the next section, for each of the four main areas of guided pathways, we describe how far along the Tennessee community colleges are in implementing completion practices based on their responses to CCRC's Scale of Adoption Assessment. (For a full description of our qualitative methodology, see Appendix A.) We also describe how the colleges are approaching particular practices of interest to the field. In the following section, we examine promising trends in first-year momentum among first-time-ever-in-college students. In the concluding section, we briefly describe other areas of practice that the Tennessee community colleges indicate are critical next frontiers in their efforts to improve student outcomes, as well as future directions for CCRC's continuing research partnership with TBR and the Tennessee community colleges.

Promising Practices

Given the impressive scale, concerted implementation, and innovative nature of the Tennessee community colleges' completion practices, there are many approaches and examples to share that highlight how administrators, faculty, and staff have developed and advanced these practices. In this section, for each of the four areas of guided pathways, we summarize the colleges' overall progress in implementing completion practices and provide specific examples of practices of note.

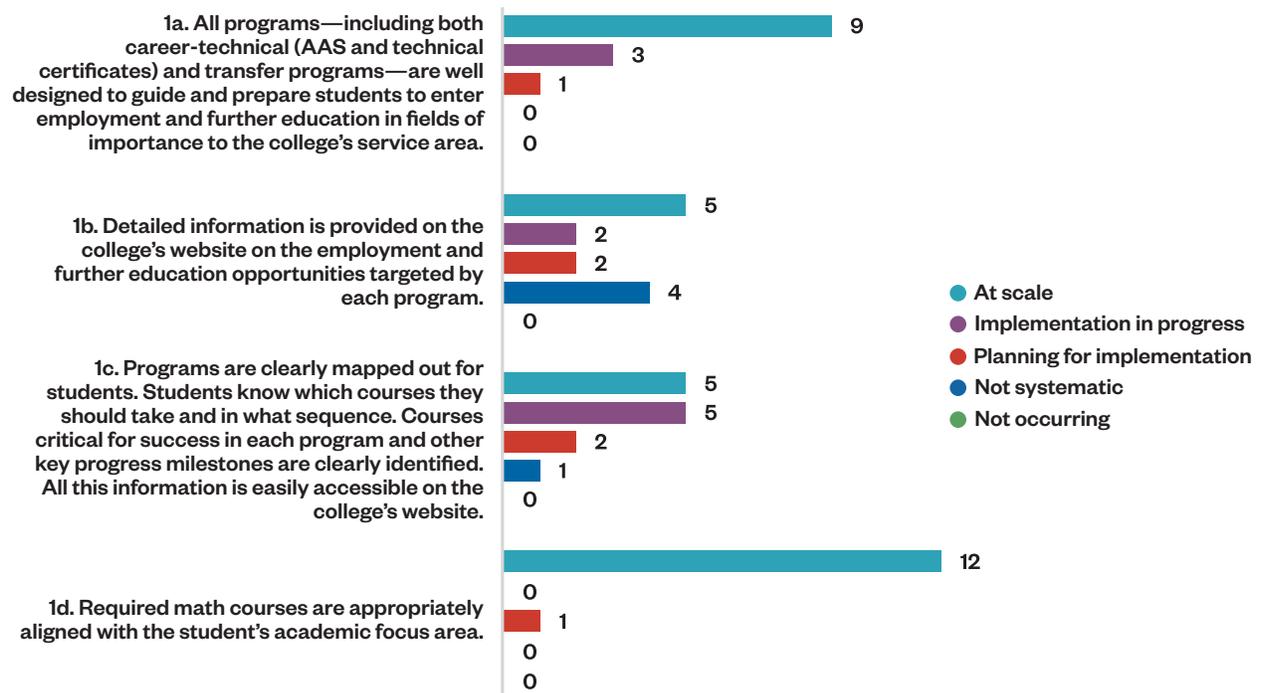
We want to emphasize that the examples provided by no means reflect the full scope of reforms being implemented by the Tennessee community colleges, nor are they intended to indicate the only or best approaches. The colleges have approached particular practices in many different ways depending on their contexts. Moreover, the reforms are a work in progress; the colleges are still refining their practices and trying new approaches, and they, TBR, and CCRC are studying the reforms' effectiveness. The examples given are meant to illustrate how different colleges are approaching completion reforms, with the aim of inspiring other colleges to consider how they might best do so in their particular contexts.

Mapping Pathways to Student End Goals

To help students understand their college and career options and plan how they will achieve their goals, the Tennessee community colleges are beginning with the end in mind, starting with students' goals for careers and further education and backward mapping educational paths to those goals. Most of the colleges have aligned their programs with local industry and transfer requirements, many have mapped all their programs, and nearly all have designated an appropriate default math pathway on their program maps. Some of the TBR community colleges have also sought to ensure that their program maps

are up to date and vetted by university and industry partners; that they include accurate information about program content, length, and cost; and that they can serve as a guide for students and advisors in developing personalized, full-program degree-completion plans. Most of the TBR community colleges are now seeking to improve the clarity of program information on their websites and working within and beyond their current transfer agreements to strengthen bachelor’s degree pathways for students. Figure 2 shows the colleges’ progress in the completion practices in this area.

Figure 2.
Scale of Adoption of Essential Practices Among the 13 Tennessee Community Colleges:
Mapping Pathways to Student End Goals



Below, we highlight the colleges’ work on mapping programs of study that lead to transfer and career opportunities and developing math pathways that are aligned with these programs.

Program Mapping

The program maps that colleges are developing vary in substance and format. Some colleges offer them as downloadable documents, while others display them on their program web pages; some do both. Many colleges include sequenced course schedules, career and wage information, and milestones on their program maps.

Roane State Community College used a cross-departmental team to develop program maps that show students “the best way” to complete each program (Keeling & Driskill, 2018). The maps offer both guidance and flexibility, helping students know what to expect and what is required as they choose a program, customize their

degree-completion plans, and gauge their progress on program milestones. Interactive maps on each program’s web page are linked to the college’s course catalog and its Degree Works system, ensuring that users are seeing the most up-to-date information. The maps include a semester-by-semester timeline of courses students should take, along with milestones and time-sensitive action steps, such as deadlines for filing the Free Application for Federal Student Aid (FAFSA), course registration periods, meetings with advisors, program admission deadlines, and exit examination dates. Key courses—those that are critical to program completion—are marked with a key symbol; recommended electives for each semester are also clearly marked in green. Each program page includes a description of “a day in the life” in that career field, three reasons to consider the program, and important considerations before declaring the major (e.g., “you must love science to do well in this program” or “admission is competitive”). The web pages for Roane State’s business administration associate of science (AS) program and dental hygiene associate of applied science (AAS) program provide good examples of the college’s program maps (Roane State Community College, n.d.-a, n.d.-b).

The college’s program mapping process has produced unanticipated benefits. The process of program mapping facilitated the review of course level designations and led to adjustments of course content sequences to ensure that students gain foundational skills and knowledge that they build on in later courses. Additionally, the mapping process has raised awareness among academic departments about other courses that students need to complete their programs of study beyond the ones they teach. As departments have worked to schedule courses for upcoming semesters, deans and chairs have increasingly engaged in cross-departmental discussions to coordinate their course schedules and ensure that students can take key program courses and nondepartmental electives they need, when they need them.

Nashville State Community College’s program maps double as worksheets to help students document their course completion and program progress. The maps include information on prerequisites, electives recommended by program faculty, and scheduling notes (e.g., if a course is only offered during the fall or spring term, or if a course should be taken in the student’s last semester). For programs that offer multiple concentrations—such as the college’s AAS in visual communications, which has concentrations in graphic design, multimedia design, photography, and web design—the college offers maps for each concentration. In addition to program maps, some of Nashville State’s program web pages include short videos about interests, skills, and jobs associated with a program, and some include information about associated student groups (e.g., an architecture and construction club open to students majoring in civil and construction engineering technology). Additionally, web pages for career-technical programs include information about how program faculty and staff work with advisory committee members to shape program curricula.



In addition to program maps, some of Nashville State’s program web pages include short videos about interests, skills, and jobs associated with a program.

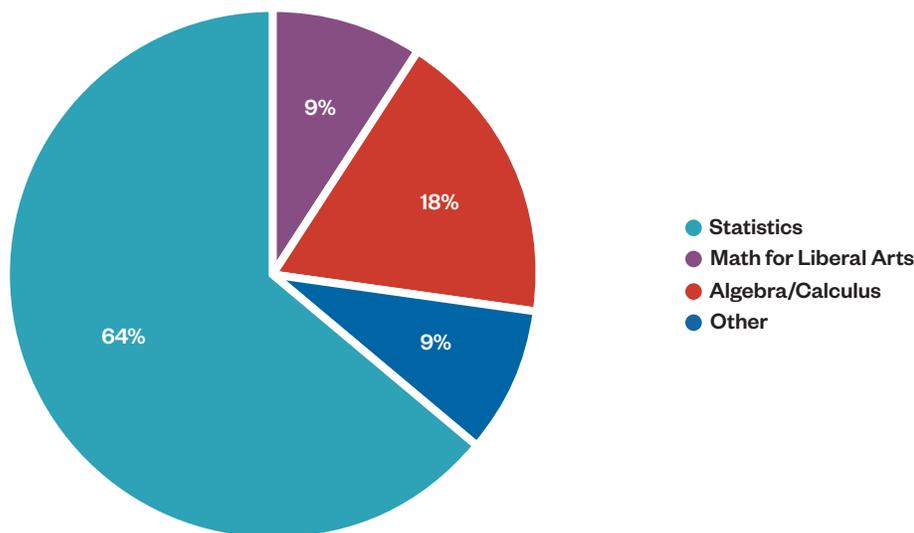
The Tennessee community colleges are continuing to develop two areas related to program mapping. First, they are working to improve the accessibility, accuracy, and consistency of program maps across their websites, catalogs, and printed materials.

Many are also incorporating program map templates into their degree-planning software to support students as they create their full-program completion plans. Second, most colleges are identifying the critical courses for each of their program areas and working to help students and faculty better understand the relationship between success in individual courses and success in a program. At some colleges, faculty are providing students with guidelines about these courses, such as a minimum grade associated with program success. Other colleges are simply informing students that particular courses have been identified as critical to their success. Some of the Tennessee community colleges are using system-wide research by Tristan Denley (n.d.-d), former vice chancellor of academic affairs at TBR, to identify critical program courses. Colleges are also sharing data on course pass and completion rates by department with faculty across the institution to provide them with a better sense of where students are succeeding and struggling in program courses.

Math Pathways

As students enter Tennessee community colleges and choose a program pathway, they are guided to take the math courses that will best prepare them for employment and further education in their chosen field. The colleges implemented math pathways at scale in fall 2015, indicating the right math courses for students on each program map. In the past, most students were placed in an algebra–calculus track, often starting at the developmental level. Since the implementation of math pathways, though, the majority of students are taking statistics to fulfill the gateway (entry-level) math requirement for their program. As shown in Figure 3, only a small number of students are placed in an algebra–calculus track, primarily because they are interested in STEM or other fields where algebra and/or calculus are required.

Figure 3. Gateway Math Courses Taken by First-Time Students in Tennessee Community Colleges, Fall 2016



Note. N = 18,956. “Other” includes the following courses: Finite Mathematics, Survey of Mathematics, Trigonometric Applications, and Math for Elementary Education.

Thus, many of the Tennessee community colleges have moved beyond simply offering alternative math pathways to embedding them in program pathways so that students take the math courses that are most relevant to their field of interest. At the same time, the colleges have developed corequisite academic supports that are aligned and customized to each particular math pathway. (TBR’s corequisite supports, which were implemented at the same time as math pathways, are discussed in detail in the next section, *Helping Students Choose and Enter a Program Pathway*.) For students who switch from one program to another with a different math pathway, many of the colleges offer bridge courses.

Even though all Tennessee community colleges have implemented math pathways and most of their students are guided to take statistics, each college’s math pathways configuration looks a little different. For example, **Northeast State Community College** offers four college-level math pathways in mathematical applications, probability and statistics, intermediate algebra, and trigonometric applications. Like other colleges, Northeast State offers corequisite courses whose content is aligned with the college-level course content in each pathway. **Volunteer State Community College** modified its recommended math pathways after realizing that a large percentage of students in health sciences and engineering programs were not passing the gateway course, MATH 1005: Algebra Essentials. The college decided that students with ACT scores below 16 would be required to take statistics or math for liberal arts before pursuing the algebra–calculus pathway. Students who later decided not to pursue a program requiring calculus would then be finished with their math requirements, and students who did pursue a STEM program could complete their math requirements at higher rates. These and other Tennessee colleges are also monitoring students’ performance in subsequent courses, along with changes in transfer requirements, to ensure that math pathways courses are preparing students for success in their programs and further education.



Volunteer State Community College modified its recommended math pathways after realizing that a large percentage of students in health sciences and engineering programs were not passing the gateway course.

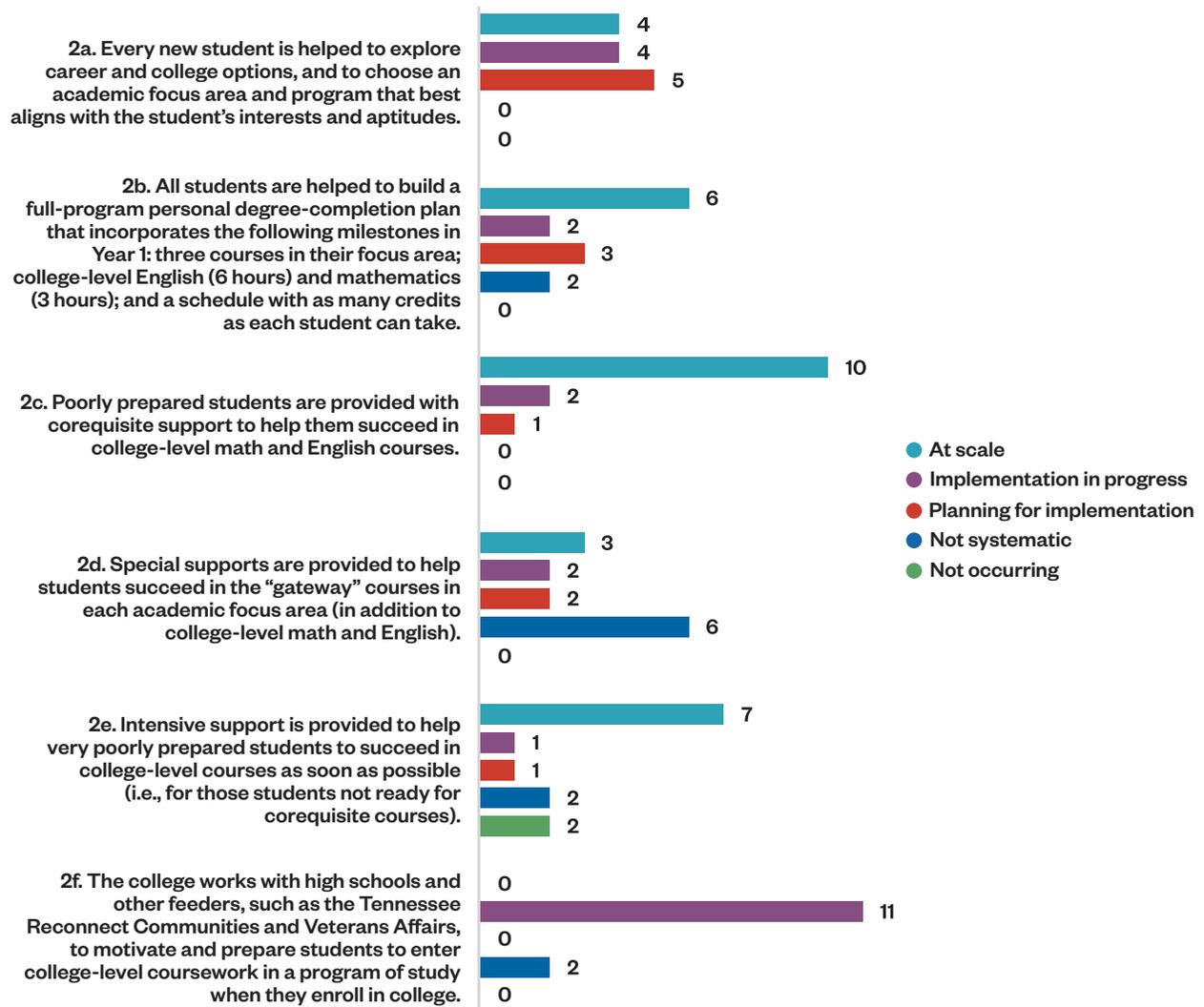
Enrollment in math courses has expanded overall at the Tennessee community colleges, since many more students are taking college-level math courses and many of these students take a corequisite learning support course as well. At the same time, the share of enrollments in statistics and liberal arts courses has grown, and the share of enrollments in algebra courses has shrunk. To accommodate these changes, colleges have had to hire additional faculty and retrain some existing ones. As a result, the per-student cost of math instruction has increased, although given the greatly improved pass rates, the cost per successful math student has declined substantially (Belfield, Jenkins, & Lahr, 2016).

Helping Students Choose and Enter a Program Pathway

To help students make informed decisions about programs and develop completion plans, the Tennessee community colleges are fully redesigning their new student intake processes to facilitate career and academic exploration and emphasize early educational planning, beginning at (or sometimes before) orientation and often continuing through the first year. The colleges are also working to integrate contextualized academic support into program gateway courses so that students can complete these courses in their first year and be able to proceed with more specialized coursework in their field of interest. Figure 4 provides an overview of the colleges' progress in this area.

Figure 4.

Scale of Adoption of Essential Practices Among the 13 Tennessee Community Colleges: Helping Students Choose and Enter a Program Pathway



Below, we highlight how the Tennessee community colleges are helping students explore their career and program options; make personalized, full-program degree-completion plans; and complete field-appropriate college-level math and English in their first year through corequisite academic support in math, reading, and writing. Nearly all of the colleges have also established early postsecondary offerings for high school students, and most are beginning to link these offerings more closely with programs offered at the college—although, as discussed in the section titled *Next Frontiers for Improving Community College Completion in Tennessee*, this is an area for further development.

Early Career and College Exploration

All TBR community colleges are engaged in ongoing efforts to redesign their intake and onboarding experience to provide opportunities for all students to explore career and academic program options. To accomplish this, the colleges are integrating career and academic exploration into their new student orientations and student success courses.

Some colleges are using *meta-majors*, or academic focus areas (Denley, n.d.-a), as a framework for exploration. Typically, the meta-majors are used to guide students toward a program choice during orientation and initial advising, to familiarize them with the academic and career options in their chosen field, and to ensure that they take the math courses and other introductory courses appropriate for their field of interest. For example, **Cleveland State Community College** organizes its programs into seven career communities on its website and for orientation, first-year seminars, and student success coaching (as described in a case study in Jenkins et al., 2018). For the most part, because students need to select a program of study for financial aid purposes and cannot select “undecided” as their major, even colleges that are using meta-majors to guide program exploration require that students select a program of study upon entry or soon after.

Most TBR community colleges require new students to take a first-semester college and career success course, in which faculty and advisors, often within an academic focus area or a division of the college, work directly with students to help them develop completion plans. Additionally, colleges are working to ensure that students take at least one course in a field of interest in their first term while also gaining exposure to other fields.

At **Chattanooga State**, new students are required to attend orientation and take a first-semester college success course specific to their program division (Chattanooga State Community College, 2018b). During orientation, students meet with deans and faculty members in their area of interest and register for first-semester courses, including their college success course, which is designed to support them in making informed decisions about their program of study. One third of the success course curriculum is common across program divisions and includes the TypeFocus career interest assessment, support from a career specialist in completing a career inventory, development of an educational plan, and an introduction to campus resources for career and college advising. The remaining two thirds of the curriculum is division-specific—as described, for example,



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in the course catalog entry for the success course in engineering and technology (Chattanooga State Community College, 2018a):

CSEG 1000: College Success in Engineering and Technology

Introductory course for incoming engineering and engineering technology students, topics include college success skills with a focus on work ethic; career exploration which includes engineering ethics, industry tours, and guest presentations from experts within the profession; tools for the engineering technicians including calculator and software use, engineering design process, and problem analysis. This course supports the Quality Enhancement Plan and includes a service learning and volunteerism component.

Volunteer State is redesigning aspects of its full-day Campus Connect orientation, which is required for all new students, to include more targeted career counseling. When fully implemented, the redesigned orientation will include the following processes, some of which are already in place:

1. When students register for orientation, the college sends an email encouraging them to discuss degree programs with an advisor before orientation if they are uncertain of their major choice.
2. At required orientation sessions, students take a career assessment that they self-score.
3. Before meeting with their assigned faculty advisor, students gather in groups organized by academic focus area, and faculty explain what specific majors in the field entail. Then, faculty discuss the possible academic and career paths for students in degree programs and help them consider if the field is a good fit for them based on their career interests, aptitudes, and academic record.
4. If students have doubts about whether they should remain in a given program area, they can have a one-on-one conversation with their advisor about changing majors and may be referred to career counseling if warranted.
5. During orientation, students also learn how to build degree-completion plans in Degree Works, create at least a first-semester schedule, and register for courses using College Scheduler.

College leaders anticipate that this new orientation method will help students see what their options are early and encourage them to think about which majors are best suited to their interests and talents.

For students at **Southwest Tennessee Community College** who have selected an academic focus area upon entry but remain undecided about their major, the college has developed first-semester course schedules specific to each focus area. The courses in these schedules introduce students to their chosen area while allowing them to explore career options and related majors. Students are expected to declare a major by the time they have earned 15 credits.

Walters State Community College and Roane State Community College offer two examples of how colleges are supporting program exploration through advising and coaching initiatives. **Walters State** is scaling up two major initiatives related to career exploration and advising. First, with its Quality Enhancement Plan, *Advise to Rise*, the college is seeking to equip advisors to better guide students in setting academic and career goals. Walters State selected general studies students as the initial target population for *Advise to Rise*. Changes in the college's advising complement other efforts, such as its Major Madness event, which is designed to inform students about academic and career options and help them select a program to pursue.

Walters State's second initiative in this area, the SIRIUS (Systematic Involvement in Retaining and Improving Undergraduate Students) program, is designed to assist all new students in academic and career exploration from before they participate in orientation until later in the first semester when they develop full-program completion plans. As students register for orientation, they are asked to take the Kuder Career Assessment. At orientation, students discuss their assessment results with career advisors. If a student and advisor determine that the student should change majors based on the assessment results and their conversation, the change occurs before coursework begins. During orientation, students are divided into groups by meta-major and hear from career advisors and division deans about programs within the meta-major and about their assigned career advisors. At this point, if students determine that another major would be a better fit, they may speak with the career advisor and move to the appropriate meta-major group. Career advisors share their contact information with students at orientation so that students can make individual follow-up appointments if needed, and they use a texting application to maintain contact with their assigned students as the fall semester begins.

Roane State is in the process of scaling up its success coach model so that all incoming degree-seeking students will be assigned a coach when they apply to the college starting in fall 2018. (Students in short-term certificate programs will meet with the program director instead.) The college's 16 success coaches, who each have a caseload of about 200 students, are assigned to students based on students' geographical preference for one of the college's nine campuses. As soon as a student applies to Roane State and is assigned a success coach, the coach contacts the student to set up a one-on-one, face-to-face meeting. During this meeting, the success coach helps the student complete interest assessments, explore fields of interest and select a program, apply for financial aid, register for first-semester courses, begin building a full-program completion plan, and navigate the college generally. Before receiving a caseload of students, success coaches undergo three months of training in the college's programs of study, transfer and career counseling, academic records, financial aid, and other relevant areas to prepare them to guide students as they complete their first 24 credits at the college (at which point they transition to faculty advisors). With the college's success coach model and mandatory orientation, all degree-seeking students are meeting with college staff at least twice before beginning coursework.



As soon as a student applies to Roane State and is assigned a success coach, the coach contacts the student to set up a one-on-one, face-to-face meeting.

Full-Program Planning

Students' personal degree-completion plans, or educational plans, should show, semester by semester, what courses they need to take to complete their program of study. Plans are ideally customized to account for each student's timeline to completion, prior credits, transfer destination, and personal interests. Of course, students' plans can and often do change as they proceed with their studies. However, without degree-completion plans, neither college personnel nor students can easily monitor students' progress toward their goals. As part of their completion reforms, most Tennessee community colleges are helping new students to create a one-semester plan during orientation and then a full-program plan during their first semester as part of a required student success course and/or in consultation with their academic advisor. Some colleges are using these plans to encourage students to increase their credit loads so that they can complete their degrees more quickly and cost-effectively. At some colleges, the plans are stored in software such as Degree Works, where they are tied to course scheduling and registration through software such as College Scheduler.

At **Chattanooga State**, new students are required to attend an orientation in which they meet with faculty and completion coaches in their division. During this initial meeting, students create a first-semester schedule that includes the appropriate math course for their program. Halfway through their first semester, students are assigned a faculty advisor in their discipline who helps them create a full-program completion plan, which is stored in Degree Works. Students and advisors can view students' program progress and upcoming coursework, and students who are considering changing their major can run "what if" scenarios in Degree Works. To make changes to their plans, students must contact their advisor, and all students seeking a degree are required to meet with their academic advisor before registering for courses each semester.

Volunteer State requires all new students to create full-program educational plans, which are stored in Degree Works and accessible to students, completion coaches, and advisors. The college also uses College Scheduler, which allows students to enter the days and times they want to attend classes and autopopulates courses for students' next semester, limiting registration options to courses that are on their plans. In this way, Volunteer State's use of College Scheduler helps students maximize the number of courses they can take during the times most convenient to them. To make changes to their plans or register for courses not on their plans, students must first meet with an advisor.



Volunteer State's use of College Scheduler helps students maximize the number of courses they can take during the times most convenient to them.

In addition to providing students with personalized guides to completion, full-program plans enable advisors to monitor students' progress and receive alerts when students deviate from their plans. Plans can also help colleges better design their course schedules, since the plans indicate which courses students will need in future semesters. (We discuss efforts by Tennessee community colleges to schedule courses based on students' needs in the next section, *Keeping Students on Path*.)

Corequisite Academic Support

Tennessee’s developmental education redesign efforts reach back at least a decade. The state’s most recent efforts began in fall 2014 and spring 2015, when nine of its community colleges piloted corequisite remediation in math, reading, and writing with promising results (Denley, n.d.-c). In fall 2015, under TBR’s corequisite remediation policy (Tennessee Board of Regents, 2016), all community colleges began implementing corequisite remediation at scale in all three subjects (Denley, n.d.-b). Most implemented corequisite remediation at scale that year, with a few colleges putting plans in place and reaching full-scale implementation by fall 2016.

TBR set policy guidelines regarding the placement of students into corequisite courses. TBR recommended that students with ACT scores of 13–18 take corequisite coursework in the given subject area. For students with ACT scores of 12 and below, colleges create a learning support plan, since these students may not yet be ready for corequisite coursework. Since all public high school students in Tennessee are required to take the ACT, most incoming students’ placement into courses and learning supports is determined by their ACT score; colleges use Accuplacer equivalents only in the absence of ACT scores. Most Tennessee community college students are now placed directly into college-level coursework (with additional supports as needed). For those students with ACT scores below 13, some colleges continue to offer prerequisite courses, and others have strengthened their supplemental workshops and programs to help address learning support needs before college, so that students are prepared to enter corequisite courses upon enrollment.

For example, **Chattanooga State** has three math placement levels. Students with math ACT scores of 19 and above enter college-level coursework without learning support. Students with scores of 13–18 enroll in a corequisite learning support course alongside a college-level course. Students with scores below 13 are contacted by Student Support Center and Testing Center staff, who help them develop a learning plan to prepare for entry into corequisite and college-level coursework. The learning plan includes diagnostic testing, tutoring support, and instruction through EdReady modules at the college’s math center. Students work at their own pace to complete the modules they need. Most finish within one semester and enter corequisite coursework the following semester.

Since 2015, Tennessee community colleges have revised and enhanced their corequisite offerings. For instance, over the past few years, **Jackson State** has redesigned its math corequisite course content, placement and progress requirements, and stand-alone developmental course offerings after a review of student success data in corequisite math courses and with the recommendations of math faculty. In the past two years, the college has developed three reforms of note. First, in fall 2017, Jackson State decided to change the content and computing platform for its corequisite math lab course, MATH 0030: Math Lab, to reflect TBR’s five competencies for learning support in math (Tennessee Board of Regents, 2010). The math lab focuses on these



Jackson State has redesigned its math corequisite course content, placement and progress requirements, and stand-alone developmental course offerings after a review of student success data in corequisite math courses.

competencies—real number sense and operations, operations with algebraic expressions, graph analysis, equation solving, and modeling and critical thinking—so that students are better prepared with the math skills needed for a broad range of courses, programs, and careers.

Second, starting in fall 2018, Jackson State’s math lab will play three roles. It will serve as a stand-alone course for students with an ACT score of 14 or below, who can enroll in college-level math once they pass the math lab; as a corequisite learning support course for students with an ACT score of 15–18 who are also enrolled in the college-level gateway course required for their major; and as a math course for students in certificate or AAS programs that do not require college-level math.

Third, Jackson State’s learning support coordinator monitors students’ attendance and progress in corequisite courses. The coordinator provides faculty and academic deans with reports each semester on students’ course performance broken down by ACT score, to be used in decisions concerning placement policies. In summer 2018, the college expanded this position to include more direct student support, changing its title to learning support coordinator/academic completion coach. Responsibilities in the revised role include staying in contact with students experiencing attendance issues and reviewing student plans to make sure that students are on track and taking the correct courses.

In our analysis of TBR data, we are seeing promising trends in the number of credits students are attempting and accumulating in their first year, as well as the percentage of students passing college-level math and English in their first year. Given the timing and scale of these reforms, it is likely that the colleges’ implementation of math pathways and corequisite remediation has contributed to the improvements in these measures of student progression. We explore these trends in further detail in the section of the report titled *Promising Trends in Leading Indicators of Student Completion*.



In our analysis of TBR data, we are seeing promising trends in the number of credits students are attempting and accumulating in their first year, as well as the percentage of students passing college-level math and English in their first year.

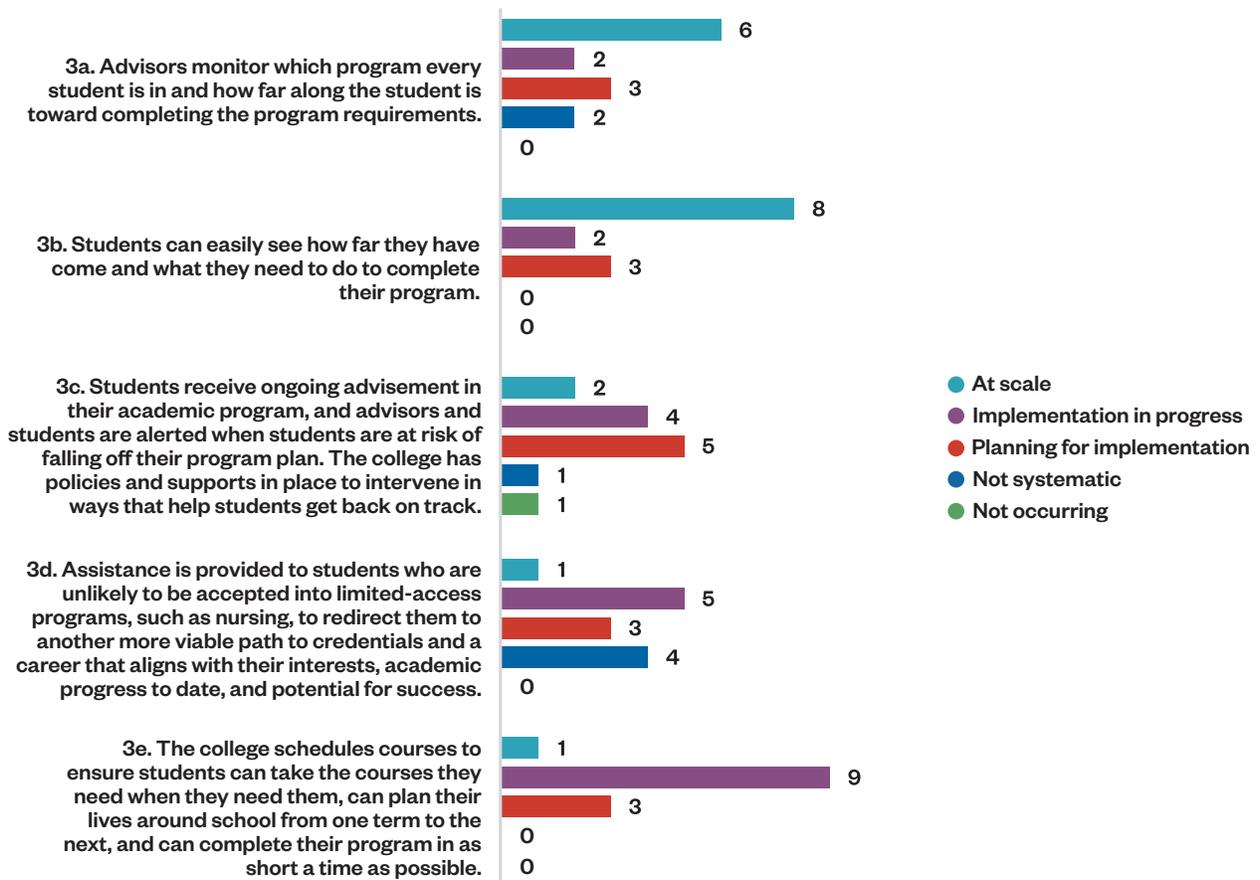
Even though they have generally seen large gains in student success in math since corequisite remediation and math pathways were instituted at scale, the Tennessee community colleges are continuing to analyze institutional data in an effort to further improve outcomes and find ways to help students who are struggling in math. For example, one college noticed that more students are completing college-level math early on—often by the end of their first semester—but that course pass rates have not changed significantly, so this college is trying to identify additional supports that could improve course pass rates. A handful of colleges are trying to determine whether students who need support in multiple subjects are more likely to pass college-level math in their first year if they take the reading corequisite course before taking the math corequisite course. Some colleges are also tracking students’ success in subsequent college coursework to ensure that students are mastering essential math skills in their initial courses.

Keeping Students on Path

Many Tennessee community colleges are implementing policies and systems so that advising, support services, and monitoring occur more proactively and systematically and are targeted to address students' individual needs. As the colleges develop these practices, advising becomes about more than helping students register for courses and expands to include discussions with students about their goals and interests, progress toward their goals on their completion plans, and connections to college supports. Figure 5 provides an overview of the Tennessee community colleges' progress in this area.

Figure 5.

Scale of Adoption of Essential Practices Among the 13 Tennessee Community Colleges: Keeping Students on Path



Below, we highlight work the Tennessee community colleges are doing to redesign advising structures and processes, develop systems that allow both students and advisors to monitor student progress, implement degree-audit and early-alert systems, redirect students from limited-access programs when necessary, and schedule their courses in a way that better supports timely progress through their programs.

Advising Redesign

Advising at Tennessee community colleges is carried out through some combination of professional advisors, faculty members, and success and completion coaches, though every college organizes its advising functions differently. A few colleges are moving toward caseload advising, where students have an assigned advisor who is responsible for monitoring their academic progress. For example, at **Roane State**, students are assigned a success coach when they are admitted to the college. (The success coaches' role in student onboarding and career exploration is described in the previous section, *Helping Students Choose and Enter a Program Pathway*.)



A few colleges are moving toward caseload advising, where students have an assigned advisor who is responsible for monitoring their academic progress.

Success coaches use a locally developed student tracking and note-taking system to record discussions with students and classify their requests and concerns, such as financial aid questions or personal concerns. The college uses this system to track the types of support that students typically request and need.

Since the implementation of mandatory advising during the spring 2018 course registration period, all Roane State students must meet with their success coach (or later, their faculty advisor) at least once per semester to receive a personal identification number to register for the next semester. Near the end of students' first year, their success coach will determine if they are ready to be transferred to a faculty advisor in their program of study or if they could benefit from additional advising by the success coach. To make this determination, a success coach will look at how many credits the student has completed (typically keeping students assigned to the success coach if they have fewer than 24 credits), whether the student has received early alerts related to academic performance or attendance, and whether the student appears to be making good academic progress. To ensure a smooth transition and assist the student's new faculty advisor, the success coach uses the notes feature of Degree Works to summarize relevant information about the student. Faculty advisors typically have caseloads of 24 students at most, and like the success coaches, they receive extensive training on advising and transfer policies. Faculty advisors serve as mentors for students in their program area, helping students with career and transfer planning.

At **Cleveland State**, all students are assigned a faculty advisor and a success coach; each student's "success network" comprises these two individuals and the student's current course instructors. Students are required to see their faculty advisor every semester for registration, and the success coaches, who are each assigned to one of Cleveland State's career communities, respond to early alerts from faculty members and refer students to campus services. The college is currently using Starfish to provide early alerts; to schedule student appointments; and to enable members of the success network to enter information about a student, including communications with the student.

Cleveland State is planning to transition its success coaches to a more proactive role by fall 2019. Success coaches will serve as the first point of contact for students and help them complete admission and financial aid processes, satisfy any Tennessee Promise or Tennessee Reconnect requirements, create an initial program plan, change majors when

needed, and revise their degree-completion plans as they solidify their goals. By spring 2019, the college plans to hire two full-time success coaches, eliminate part-time success coach positions, bolster coaches' training in advising, and use student intake surveys to help coaches target their support. Under this new system, the handoff to faculty advisors will typically take place during the spring of students' first year, with faculty advisors supporting students as they finish up their programs and transition to careers and four-year institutions.

Most TBR community colleges are still working to decide on the optimal advising structures and processes. For instance, many colleges are still trying to determine the division of labor among advisors, success or completion coaches, and faculty members. As some colleges noted, student–advisor ratios can be very high, making it difficult for advisors to meet regularly with every student. In response to this challenge, the colleges are working to reorganize their advising structures and redistribute advising responsibilities across departments and individual staff members.

Student Progress Monitoring

More than half of the TBR community colleges have systematized student progress monitoring and enabled students, faculty, and advisors to access students' regularly updated, personalized, full-program degree-completion plans so they can see which courses and milestones students have completed and which they are planning to complete and when. Colleges are using this information to determine when students are struggling or deviating from their plans so they can implement effective interventions to get them back on track. Some colleges keep an online record of notes from advisors' interactions with students that advisors, faculty, and other student support staff members can view and contribute to. Colleges are also working to delineate which staff members are responsible for monitoring particular aspects of students' experience, for responding when students are falling off-path, and for following up to make sure students receive the necessary supports.



Colleges are working to delineate which staff members are responsible for monitoring particular aspects of students' experience.

To ensure that students are taking the courses on their plans, many TBR community colleges require students to meet with an advisor, success coach, or faculty member prior to registration in their first term and, in some cases, in subsequent terms. Jackson State and Volunteer State are two examples of colleges that monitor students' progress through mandatory advising.

In addition to using registration holds so that students are required to meet with advisors each semester, **Jackson State** developed the ANCHOR (Advise, Navigate, Coach, Help, Orient, and Relate) model of academic advising to move beyond advising focused on course registration to a more comprehensive approach that blends developmental and proactive advising practices (Jackson State Community College, 2016). The college is using AdvisorTrac software to document faculty and staff interactions with students. The college promotes the ANCHOR model at campus events and holds ANCHOR Week prior to registration each term, which consists

of career exploration lectures, strengths and aptitude testing, time- and stress-management workshops, and open office hours for advising with faculty and staff. Since implementing the ANCHOR model, Jackson State has found that students are more likely to take the courses they need to take to complete their programs and therefore less likely to accumulate excess credits.

Volunteer State places a hold on students' records and course registration if they do not meet a critical course milestone on their completion plan. Faculty from every program have identified milestone courses that students need to perform well in to succeed in the program. For example, in health sciences programs, if students in Anatomy and Physiology do not receive an A or B in the course, they are required to meet with an advisor before registering for the next semester's courses. In instances where students have already registered for the next semester's courses before final grades are released, advisors may have to reach out to students to discuss possible revisions to their schedules.

Degree-Audit Systems

Many TBR community colleges are using degree-completion plans together with degree-audit systems to help students stay on track. These systems send notifications to students and advisors if students register for courses that are not on their plans and monitor certain student progression metrics.

Several years ago, **Walters State** adopted the Curriculum, Advising, and Program Planning (CAPP) degree-audit system and began using it in mandatory advising sessions to allow students and advisors to track students' progress toward credential completion. In summer 2017, Walters State began using its degree-audit system more proactively to deter students from taking courses outside of their program of study.

The CAPP system generates alerts for out-of-program registrations, and the financial aid office sends lists of students with these alerts to the academic division offices and advisors. During the summer and winter breaks, the college's advisors call all students with out-of-program course registrations for the upcoming term to verify or change their program of choice and discuss their plans and course selections. During the academic semesters, division deans and faculty members contact students with out-of-program registrations and advise them to make appropriate schedule adjustments. This approach has resulted in fewer students being dropped from courses at the purge dates because of out-of-program registrations.



In summer 2017, Walters State began using its degree-audit system more proactively to deter students from taking courses outside of their program of study.

Through a project called Pathways to Success that is funded by the Tennessee Higher Education Commission through the Institutional Outcome Improvement Fund Grant, **Jackson State** is developing individualized, digital pathways to degrees for students that provide a clear roadmap to graduation and allow students and the institution to track students' progress. When students reach certain progression points—such as 12-, 24-, or 36-credit-hour milestones—they receive targeted communications from their

completion coach (or, for the 36-credit-hour milestone, from the college president) so that they are aware of their progress and are encouraged to work toward their next progression points. The college has found that personalized email communications like these often prompt positive responses from students, strengthening their connections with faculty and staff as they reply to progress notification emails with questions or requests for direction. Completion coaches connect students to academic and nonacademic supports on- and off-campus as needed and track and guide students to degree attainment. Since Pathways to Success was implemented in the middle of the 2017–18 academic year, the college will have the opportunity in the coming year to examine the impact of the changes on students’ experience from entry through the end of their first year.

In colleges across the country, a common barrier to systematic advising and progress monitoring is that not all students have a full-program plan against which progress can be measured. However, as discussed in the previous section (*Helping Students Choose and Enter a Program Pathway*), many of the Tennessee community colleges are helping all students build full-program plans by the end of their first semester. In most cases, these plans are stored in colleges’ student information systems, where they are accessible to students, advisors, and other college staff. Most TBR community colleges use Degree Works to store plans and track student progress; some are implementing the planner version of Degree Works so that advisors can edit student plans more easily. **Dyersburg State Community College** and a handful of others have customized Degree Works so that they can alert advisors and students to off-plan course registration attempts and block students from registering for those courses. Once this alert occurs, advisors follow up with students by phone or email to determine why they attempted to register for courses not on their plans and to ensure that students register for courses that are on their plans (revising those plans if necessary).



Dyersburg State Community College and a handful of others have customized Degree Works so that they can alert advisors and students to off-plan course registration attempts and block students from registering for those courses.

Several colleges, including **Roane State**, **Volunteer State**, and **Walters State**, also mentioned that their advisors are working closely with their financial aid offices to ensure that students are only registering for courses required for their major. Through a financial aid audit of students’ programs of study, the financial aid office generates notifications for students whose course registrations fall outside of their program requirements, since courses outside of a student’s program of study will not be covered by federal financial aid.

Proactive Redirection From Limited-Access Programs

Most colleges offer competitive programs that are restricted to a small number of students each year, such as nursing and radiography. As a result, many students seeking admission to these programs are turned away. Typically, colleges reactively redirect students from limited-access programs—sometimes after they have persisted in seeking acceptance after multiple rejections, and often when students have not considered alternative paths to pursue. A few Tennessee community colleges, however,

have begun to develop proactive strategies to help students assess their interest in and aptitude for such programs and learn about alternative program and career paths they can take if they decide not to pursue entrance to a particular program.

In 2017, **Roane State** created an AS program track in pre-allied health sciences with courses that meet the prerequisite requirements for a number of limited-access AAS programs, such as dental hygiene, health information technology, opticianry, radiologic technology, and surgical technology. Students initially enroll in the pre-allied health sciences track, and if they are admitted to an allied health sciences AAS program, they can switch into the program. If they are not admitted, they may continue taking courses in pre-allied health sciences, graduate with an AS, and transfer to a university with junior standing, or they may change their major. Program faculty are currently adding hyperlinks to related university transfer programs on Roane State's pre-allied health sciences web page to help students understand their transfer options and to facilitate faculty advisors' conversations with students about transfer.

Volunteer State is working to improve its new student orientation to support students' proactive career exploration and has begun to highlight viable paths for students who are not likely to be admitted to limited-access programs. In spring 2017, Volunteer State began reaching out to students with low Anatomy and Physiology grades but high math grades who were not admitted into a limited-access health sciences program and recruiting them to the computer science program, which is seeking to attract more female students. The college used positive language and deliberate timing, sending letters to students in April (when students receive acceptance and rejection letters from the health sciences programs) that read, "We are actively recruiting in the computer science program and you are a strong candidate for this program." This past spring, Volunteer State recruited several students into its computer science program, including 10 women.



Volunteer State began reaching out to students who were not admitted to a limited-access health sciences program and recruiting them to the computer science program.

Student-Responsive Course Scheduling

For many colleges, the process of scheduling courses for the upcoming year occurs at the department or division level and consists of rolling over the previous year's schedule with few changes or without coordination across divisions. This process yields less-than-optimal results for both students and colleges: Some courses students need to take for their programs are not offered in a given semester, and some course sections end up being canceled because they are undersubscribed. The Tennessee community colleges have recognized the need to improve their scheduling processes and are working to enable students to take the courses they need to progress on their plans at times convenient to them and to anticipate their schedules for future terms so that students can better plan their lives around school.

As part of its completion work, **Cleveland State** has moved to a full-year schedule and to block scheduling in certain programs. To create the course blocks, each program chooses

certain time slots across two years, and all courses in that program—including program-specific, general education, and learning support courses—are offered in those time slots. For the 2018–19 academic year, courses for over 25 of the college’s highest enrollment degree and certificate programs will be offered in a variety of block configurations. The block schedules include evening, weekend, Monday and Wednesday, Monday through Thursday before noon, fully online, and accelerated options. For example, the college’s AAS in business will be offered in evening and accelerated blocks, its AS in education in a weekend block and fully online, and its emergency medical technician certificate in two-day and evening blocks. According to the college, an added benefit of the block schedules is that they can lead to the formation of student cohorts. Cleveland State acknowledges that this type of scheduling will be more difficult to implement for programs with lower enrollment, but it is considering ways to help those programs identify the best times for students’ course blocks. The college also revised its template for daily class meeting times, pushing classes earlier and adding an open period twice weekly at noon for student clubs, advising, and study. Finally, as part of its “15 to Finish” strategy, Cleveland State emphasizes to students how taking summer courses can help them maintain a course load that will keep them on track to completion. To ensure that summer courses will help students progress along their plans, Cleveland State analyzes student plans and builds its summer course schedules to help students finish their first year on track or even get a head start on their second-year courses.

In 2016, **Volunteer State** introduced a two-day-per-week schedule in which students can take all of the courses on their plan either on Monday and Wednesday or on Tuesday and Thursday. According to the college, students have embraced this schedule because it frees up the rest of their week for studying, work, and family responsibilities while providing some predictability from semester to semester. College leaders believe that enabling students to take more courses on their plans in predictable blocks during the week, combined with “15 to Finish” messaging and other strategies to promote on-time completion, has helped full-time equivalent enrollment to grow more quickly than enrollment. Between 2013 and 2016, the college increased headcount enrollment by 500 students but increased overall full-time equivalent students by 900. To further improve students’ ability to take higher credit loads, Volunteer State is moving to two-year schedules and will offer more online courses. The two-year schedules will help students know in advance which courses they will be taking and when, and the online courses will help accommodate incoming adult students in the Tennessee Reconnect program.

Ensuring That Students Are Learning

As the Tennessee community colleges enhance the alignment of their program curricula with careers and further education, they are also seeking to ensure that their programs provide students with rich learning experiences that prepare them for their post-community college pursuits. At some colleges, faculty and staff are working together to strengthen the curriculum and learning opportunities in each program so that students can develop disciplinary knowledge and skills, gain real-world experience, and become confident learners in their field. Figure 6 summarizes the progress the Tennessee community colleges have made in the completion practices in this area.

Figure 6.

Scale of Adoption of Essential Practices Among the 13 Tennessee Community Colleges:
Ensuring That Students Are Learning



Below, we describe how colleges are assessing program learning outcomes and using them to improve teaching and inform professional development. We also discuss how they are improving teaching and learning across program pathways by providing active learning opportunities and encouraging students to reflect on, apply, and transfer what they have learned as they approach program completion.

Strengthening Program Learning Outcomes

All of the Tennessee community colleges engage in regular program review, some annually and others every two or three years. Most of the colleges have well-established program review systems but would like to improve their ability to collect and use data on teaching and learning quality to refine existing programs and develop new ones. Additionally, the colleges are beginning to consider how program review might be more intentionally connected to professional development. Most are also planning to systematize and deepen their processes for developing and reviewing program learning outcomes by better identifying the skills required for success in program-related

employment and further education and by using the results of program learning outcomes assessments to strengthen teaching and learning.

One challenge for the TBR community colleges (and others nationally) is determining program learning outcomes and developing associated assessments for transfer-oriented programs. While most of the colleges have established program learning outcomes for each of their AAS and occupational certificate programs, most AA and AS programs share general education program learning outcomes rather than discipline-specific outcomes aligned with transfer programs in the same field. Most of the colleges use embedded course assessments to evaluate students' discipline-specific learning at various points in their program, and some use program exit exams. For programs that include few discipline-specific courses and a large number of general electives, however, it can be especially challenging to evaluate students' preparedness for field-specific upper level coursework at transfer institutions. The Tennessee community colleges are currently exploring ways to improve how they assess students' readiness for transfer.



Most of the colleges have well-established program review systems but would like to improve their ability to collect and use data on teaching and learning quality.

Improving Teaching and Learning Across Program Pathways

In spring 2015, the Tennessee community colleges began a system-wide effort to implement high-impact practices for teaching and learning. Drawing on research by Kuh (2008), TBR defined high-impact practices as pedagogical approaches that positively affect students' academic engagement through prolonged and deepened teaching and learning experiences (Tennessee Board of Regents, n.d.). Since then, TBR and its community colleges have engaged in continued efforts to build the infrastructure to support these practices; to scale them to reach more students, especially those from groups underrepresented in higher education; and to assess their implementation and impact through campus self-studies and the review of data on students' academic attainment.

Until recently, the colleges' efforts to spread high-impact teaching and learning practices occurred mostly parallel to their work on strengthening program pathways. As the colleges seek to expand the use of these practices, however, they are focusing on better integrating them across programs, not just in individual courses. This way, faculty are more likely to adopt practices that will help students build skills that are relevant to their fields of study.

The Tennessee community colleges understand that embedding high-impact practices across programs will require a change in campus culture. Below, we describe some of their notable efforts to bring about such change. In particular, we focus on their efforts to provide opportunities for active and cocurricular learning, as research indicates that such experiences help students see the relevance of their coursework to their lives outside of school, motivate them to pursue degrees, and give them a grounding in the

types of learning that are valued in workplaces and in advanced education (Bailey et al., 2015, Chapter 3).

Cleveland State plans to create one learning community (or “career community”) for each of its seven academic focus areas, starting with five to be implemented in fall 2018. Students in the learning communities will take three common courses—a major-related course, a general education course, and a first-year seminar—and will receive support from a career community success coach. A majority of Cleveland State faculty engage students in service learning in at least some of the courses they teach, and work-based learning is required or strongly encouraged in all AAS programs, typically in students’ last year.

At **Jackson State**, many faculty across divisions are spending less time lecturing and more time engaging students in active learning. To enable this shift in how class time is used, faculty are having students submit homework before class. Business and nursing faculty are also using technologies to enhance student learning outside the classroom—including BlueJeans, a video-conferencing program, and Echo360, a cloud-based video platform that makes lectures available to students—which enables faculty to emphasize active learning during class. The college’s nursing program has seen a 15 percent increase in retention since incorporating active learning, with students learning on-the-job skills that nursing faculty have identified as critical for success as nursing professionals.

At Jackson State, many faculty across divisions are spending less time lecturing and more time engaging students in active learning.

Roane State has begun to disaggregate course data to inform interventions for particular student populations. The college examined success rates in its 20 courses with the highest enrollment—most of them program gateway courses—and found that nearly all had increased since 2013. However, when the college disaggregated the data by race and ethnicity, it found that gaps in success rates between White students and Black and Hispanic students persisted. Roane State is working to address these gaps in several ways. First, as part of the Southern Association of Colleges and Schools Commission on Colleges accreditation process, the college is working on a Quality Enhancement Plan, the aim of which is to increase collaborative and real-world learning in the classroom. The college is also working to ensure that first-generation and other underrepresented students in particular are encountering these learning opportunities. Additionally, in fall 2018, Roane State is piloting a special topics section of ENGL 1010: Composition I focused on the theme “Representation Matters,” in which issues of race and the media will guide course readings, assignments, and discussions. The course is advertised in the schedule as focusing on these topics, and college staff are encouraging students to enroll. The college also plans to examine the results of learning outcomes assessments more closely to improve teaching and learning for underrepresented students, and it is taking steps to ensure that its online learning environments are working for all students who take online courses.

Chattanooga State supports students’ use of ePortfolios as tools to gather and showcase their academic work and reflect on their learning, goals, and successes through its

on-campus ePortfolio Lab staffed with student mentors (Chattanooga State Community College, n.d.). All students who are in Chattanooga State's college success course are required to reflect on their experiences using the college's ePortfolio platform. Each success course has a peer mentor paid through a Title III grant who visits the course three times throughout the semester. During the first visit, mentors share their own ePortfolio and explain the benefits of developing an ePortfolio for learning and future employment. During the second visit, mentors provide students with technological support as they complete written reflections on what they have learned from the career, personality, and interest assessments they completed as part of the course. During the third visit, mentors provide examples of a written reflection assignment on work ethic and demonstrate the tools provided to personalize the ePortfolio. Students' ePortfolios typically include projects, examples of learning activities across all their courses (for example, recitals and artwork for fine arts students), written reflections on learning experiences related to Chattanooga State's institutional learning outcomes, and their resume or transfer application essay. At the end of the term, to encourage high-quality student work in the ePortfolios, peer mentors assign gold, silver, and bronze electronic medals using a scoring rubric.

The extent to which Chattanooga State students use the ePortfolio platform after completing their college success course depends on their program. Many of the college's general education courses require students to develop ePortfolios. Some programs at Chattanooga State, such as the photography, graphic arts, and administrative programs, are fully committed to ePortfolio development and report that ePortfolios increase the chances that students will get jobs in related fields. Students who participate in service learning or study abroad are required to reflect on their experiences using ePortfolios. The college intends to further develop capstone experiences that include contributions to students' ePortfolios.

With support from a National Association of System Heads grant, **Cleveland State's** early childhood education faculty have systematically embedded high-impact practices throughout the program, including using online portfolios that extend through the entire program. The psychology program is adopting a similar model. A few programs at Cleveland State, including the AS program in forestry, wildlife, and fisheries, incorporate undergraduate research throughout.

At **Southwest Tennessee**, students in most programs, including business, culinary arts, and paralegal programs, engage in work-based learning or internships. The college created the High Impact Practices and Innovation Office, led by an associate dean, to help formalize and expand high-impact practices throughout the curriculum and particularly in transfer programs. This office was set up as part of a reorganization of the humanities department to assist with coordinating various opportunities, including study abroad, service learning, and honors programs. In addition to coordinating high-impact practices across campus, the office also explores the use of online portfolios through faculty learning communities. At **Walters State**, all AAS programs include work-based learning and clinical programs, and transfer programs have a strong focus on service learning. The college plans to continue to scale up high-impact practices across AAS and transfer-oriented degree programs.

Promising Trends in Leading Indicators of Student Completion

As described above, the community colleges in Tennessee are going “all-in” in implementing student success reforms consistent with the guided pathways model. They are undertaking multiyear, whole-college transformations with the goal of improving college completion for all students. This comprehensive approach, while promising for improving student outcomes at scale, is challenging to evaluate, as there are no students unaffected by the reforms to serve as a control group. Furthermore, these reforms take three or more years to fully implement, so lagging indicators of success, such as completion and transfer rates, are not timely enough for use in assessing and improving the early impacts of these reforms. Instead, CCRC recommends using a set of *early momentum key performance indicators* (KPIs)—leading indicators, measurable in one year, of longer term outcomes—to assess the impacts of whole-college reforms.¹ The early momentum KPIs are based on metrics of first-year student performance that are correlated with higher completion rates over a longer time frame (Jenkins & Bailey, 2017). Our discussion below of trends in the Tennessee community colleges’ early momentum KPIs focuses on students’ accumulation of college-level (i.e., nonremedial) credits and completion of gateway college math and English courses. We have included additional results in Appendix B on persistence from fall to spring and overall college-level course completion in the first year.



The early momentum KPIs are based on metrics of first-year student performance that are correlated with higher completion rates over a longer time frame.

We calculated these metrics using unit record transcript data from fall 2010 through spring 2017 shared by TBR for fall cohorts of first-time-ever-in-college (FTEIC) students (including full- and part-time students but excluding current or former dual enrollment students). In our work with colleges and systems using the early momentum KPIs, we encourage colleges to also calculate these measures for additional cohorts of students (e.g., returning or continuing students and dual enrollment students). However, to assess the effects of large-scale college reforms on student success across institutions, which may vary in their proportion of students with prior college experience, we recommend using FTEIC cohorts. Restricting the sample to FTEIC students makes it possible to compare students who are all beginning at the same “starting line” in that they have had no previous college experience. More information about the sample and KPI definitions used here, along with tables showing average trends in the KPIs across the TBR community colleges, is included in Appendix B.

In addition to increasing college completion rates for students generally, a fundamental goal of Tennessee’s completion efforts and related guided pathways reforms is to close equity gaps, such as gaps between students of color and White students and between traditional college-age students and older students. It is unlikely that equity gaps in completion rates will close unless colleges can first close gaps in early momentum KPIs. Therefore, we examined not only trends in KPIs among all students in our cohorts but also to what extent colleges have made progress in closing equity gaps. We measured these

gaps by race/ethnicity, age, and gender. Gaps by gender were relatively small across the KPIs, slightly in favor of female students. In the reporting below, we focus on the equity gaps by race/ethnicity and age.

In general, after a period in which KPIs improved steadily, the Tennessee community colleges saw substantial jumps on most of the KPIs with the fall 2015 FTEIC cohort that were sustained with the fall 2016 cohort. On several measures, KPIs for Black and Hispanic students increased even more than for Whites in percentage terms, although the rates for students of color started from much lower bases, and so even with improvements, gaps in achievement remained between those students and White students. Early momentum KPIs for younger students also improved markedly starting with the 2015 cohort, though KPIs for older students did not improve as much, and gaps in achievement by age remain.



The Tennessee community colleges saw substantial jumps on most of the KPIs with the fall 2015 FTEIC cohort that were sustained with the fall 2016 cohort.

It is noteworthy that the Tennessee community colleges saw big gains in these metrics starting with the fall 2015 FTEIC cohort, since most of the colleges implemented key practices described in the last section at scale beginning in fall 2015—in particular, math pathways; required corequisite math, writing, and reading; and redesigned new student advising. However, we cannot say definitively that these reforms caused the improvements observed. We are only able to observe two years of data for these reforms' full implementation, and other factors may also have contributed to the trends we found. Notably, the implementation of Tennessee Promise in fall 2015 very likely explains some of the improvements in the early momentum KPIs, since it increased enrollment by students just out of high school, who are more likely to attend full-time (given the incentives provided by Tennessee Promise for full-time enrollment). In general, as is the case in many community colleges nationally, the age composition of students entering the Tennessee community colleges shifted much younger throughout the tracking period—from 61 percent ages 18–19 in fall 2010 to 81 percent in fall 2016.² CCRC will continue to partner with TBR and its community colleges to see if these gains are sustained over time and to try to disentangle the factors underlying them. Still, the gains the Tennessee colleges have achieved since implementing key completion practices are encouraging.

Gains in Credit Momentum

As shown in Figures 7 and 8 and Table B2, the TBR community colleges achieved substantial growth in credit momentum KPIs among fall FTEIC entrants from 2010 to 2016. Most of these KPIs remained steady or showed modest improvements for the 2010–2014 cohorts and then exhibited larger jumps in improvement for the 2015 and 2016 cohorts. Table B2 summarizes these changes throughout the tracking period, reporting both the net percent changes and the net percentage point changes from 2010 to 2016. Percentage increases ranged from 36 percent to 157 percent, with three KPIs more than doubling (the proportions of students who attempted 15 or more credits at any level in their first term, earned 12 or more college credits in their first term, and earned 24 or more credits in their first year). For example, 13 percent of fall 2010 cohort students completed 12 or

more college credits in their first term, and 12 percent completed 24 or more credits in their first academic year. Six years later, 30 percent of students in the fall 2016 cohort completed 12 or more college credits in their first term, and 24 percent completed 24 or more credits in their first academic year (net improvements of 136 and 101 percent, respectively).

Figure 7.
First-Term Credit Momentum KPIs

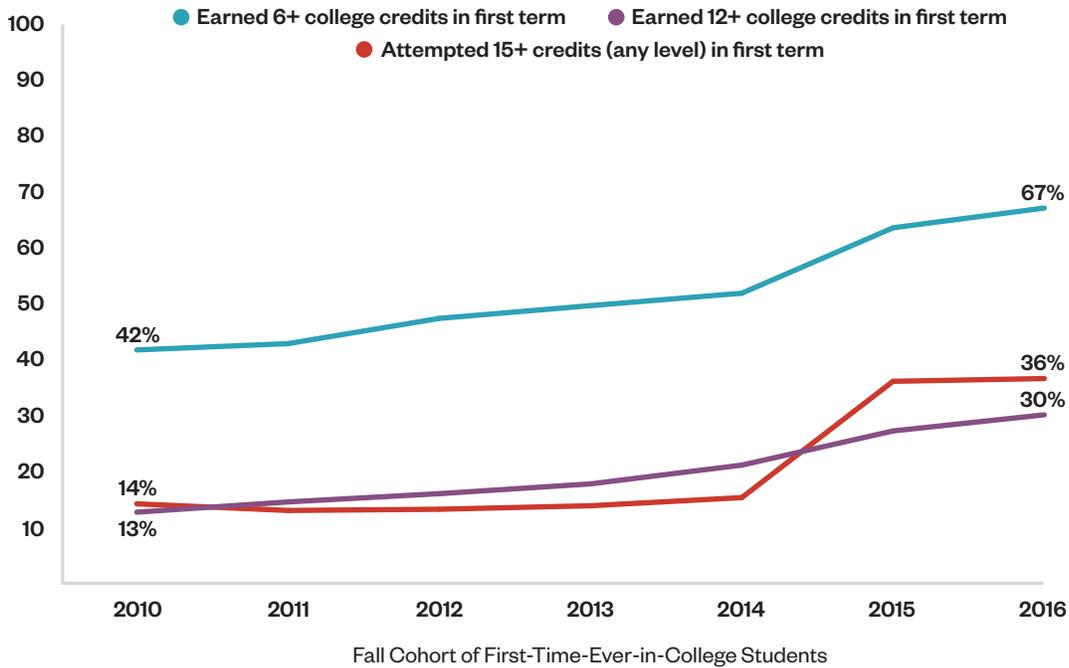
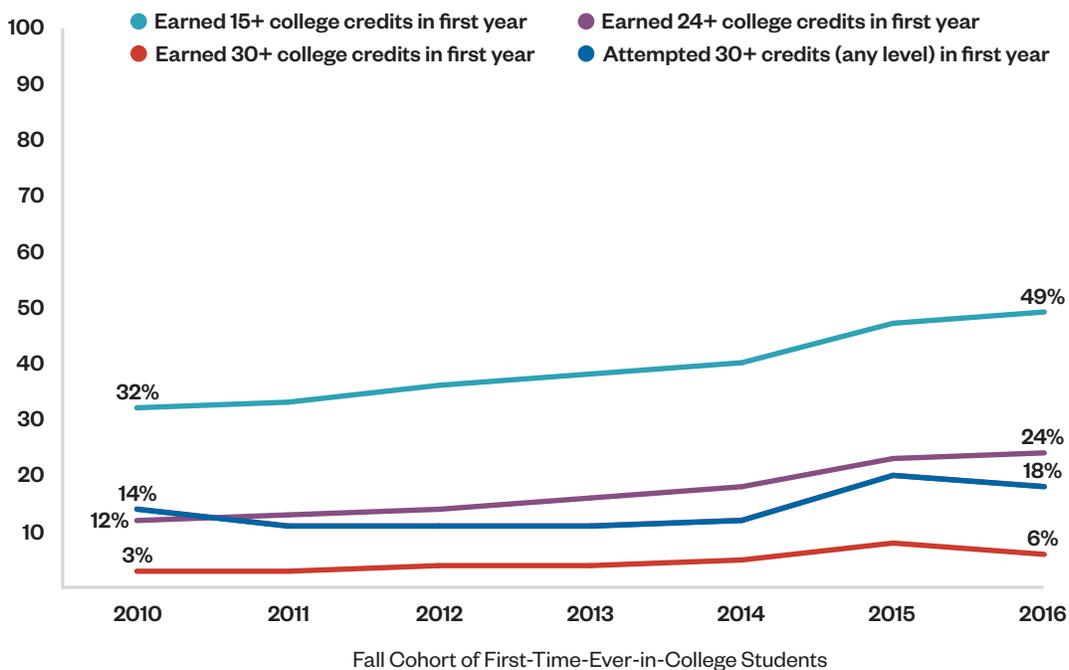


Figure 8.
First-Year Credit Momentum KPIs



Figures 9–10 and Table B3 present the changes in credit momentum KPIs by race/ethnicity. We present both percentage changes from 2010 to 2016 and percentage point equity gaps remaining in 2016, since percentage changes over time can be deceptively large for KPIs with very low values at the beginning of the tracking period. On most KPIs, Black and Hispanic students experienced large gains in terms of percentage change from 2010 to 2016, but as Figures 9–10 show, KPIs for these students were quite low in 2010. Therefore, while encouraging, the improvements in KPIs for Black and Hispanic students must be considered alongside the equity gaps remaining in 2016, which ranged from 2 to 24 percentage points. For example, from 2010 to 2016, the share of students earning 12 or more college credits in their first term and 24 or more credits in their first academic year increased substantially for Black, Hispanic, and White students—upwards of 100 percent in many cases. In 2016, however, there remained gaps of roughly 20 percentage points on these KPIs between Black and White students and gaps of about 10 percentage points between Hispanic and White students.

“ While encouraging, the improvements in KPIs for Black and Hispanic students must be considered alongside the equity gaps remaining in 2016. ”

Figure 9. Proportion of Students Who Earned 12+ College Credits in Their First Term by Race/Ethnicity

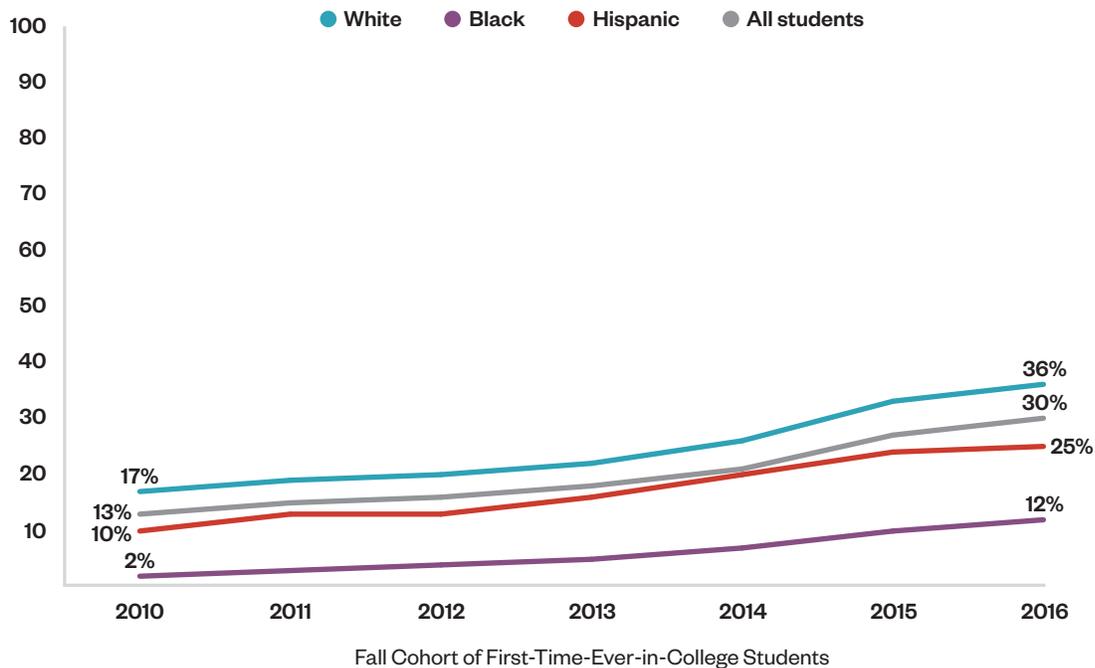
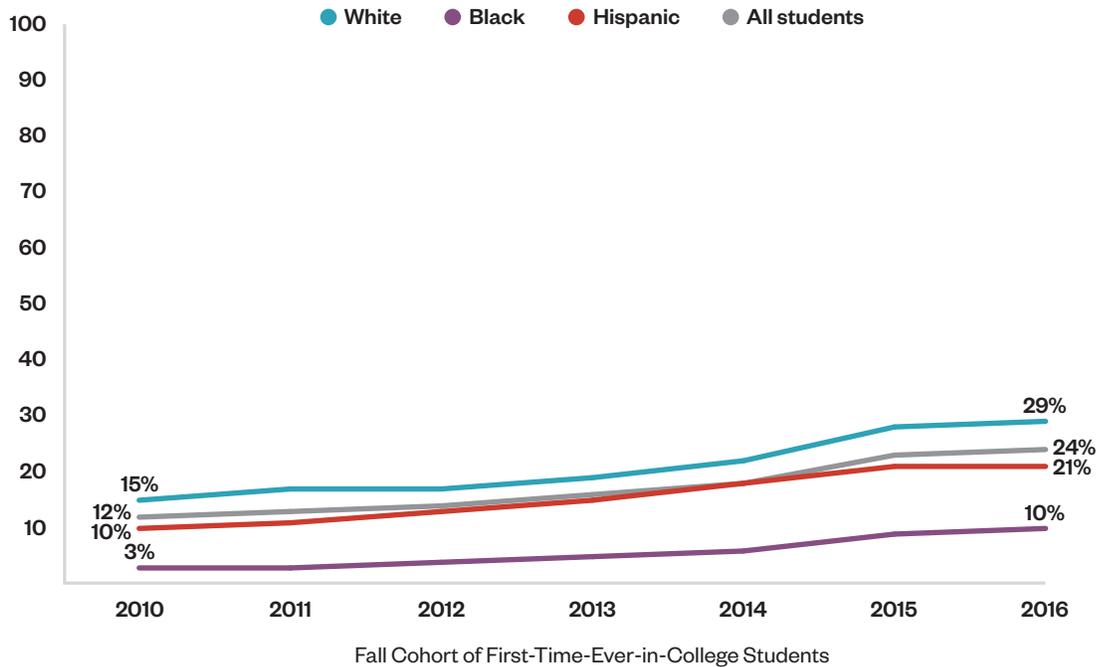


Figure 10.

Proportion of Students Who Earned 24+ College Credits in Their First Year by Race/Ethnicity



Increases in credit momentum KPIs were mostly larger for younger students than for those who were 25 or older when they started college. As shown in Figures 11–12, the proportions of students who earned 12 or more college credits in their first term and 24 or more college credits in their first year increased steadily from 2010, with larger jumps in 2015 for students aged 18–19 and 20–24. In contrast, trends in KPIs were flat or more modest for students aged 25 or older. In some cases, the KPIs actually decreased for older students. (See Table B4.) Unsurprisingly, given these trends, there were still substantial gaps in 2016 between younger and older students for each of the credit momentum KPIs.



Increases in credit momentum KPIs were mostly larger for younger students than for those who were 25 or older when they started college.

Figure 11.
Proportion of Students Who Earned 12+ College Credits in Their First Term by Age

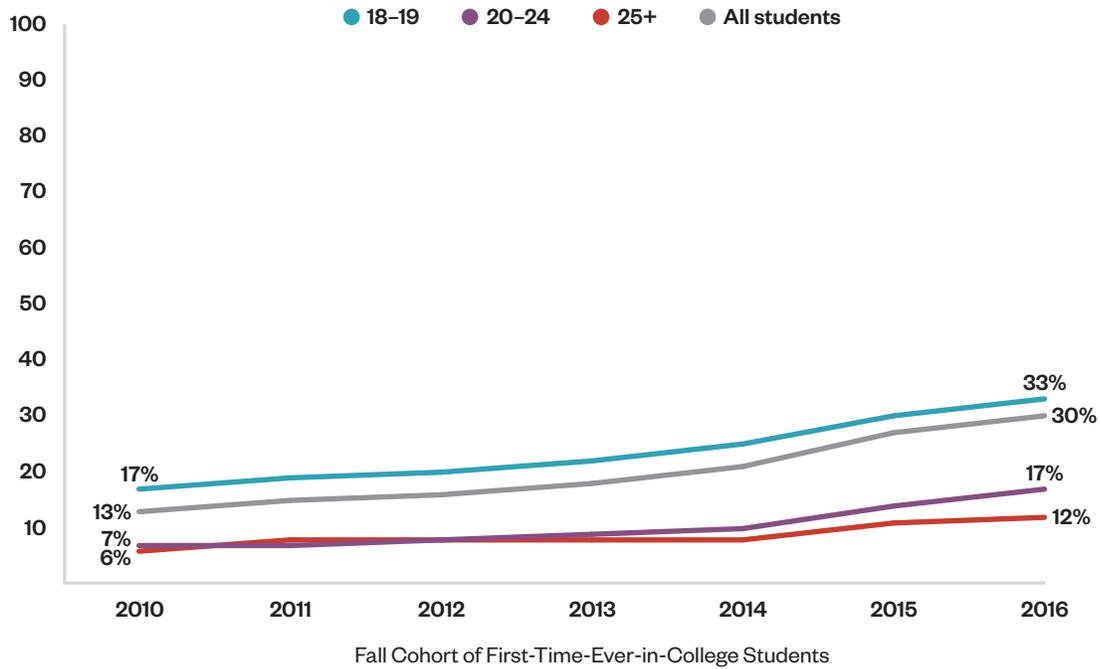
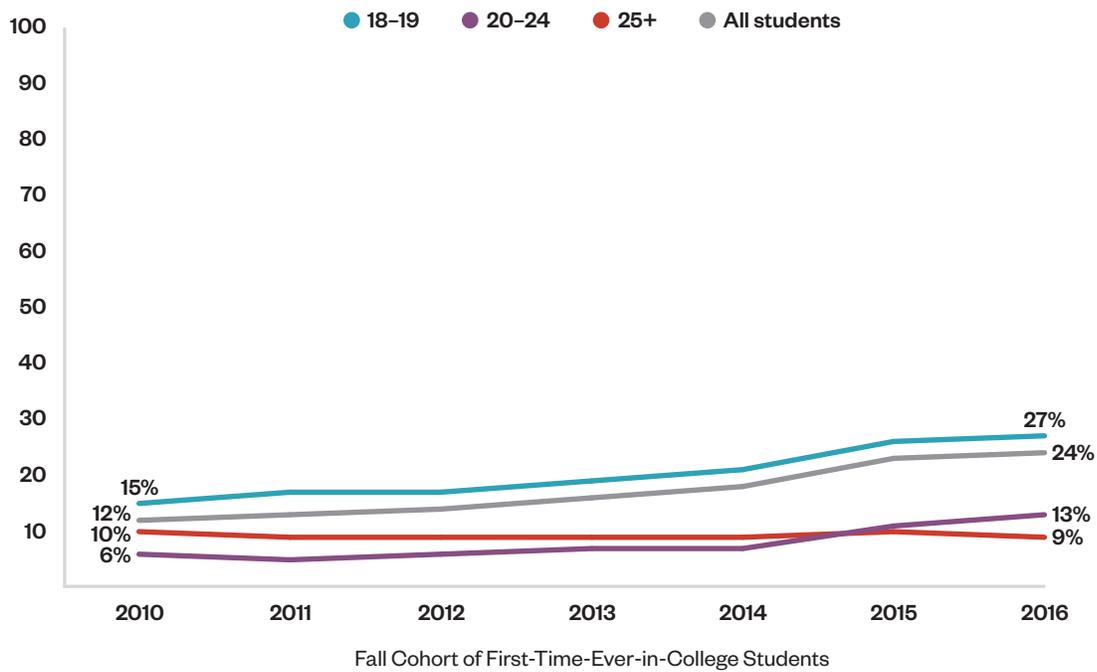


Figure 12.
Proportion of Students Who Earned 24+ College Credits in Their First Year by Age

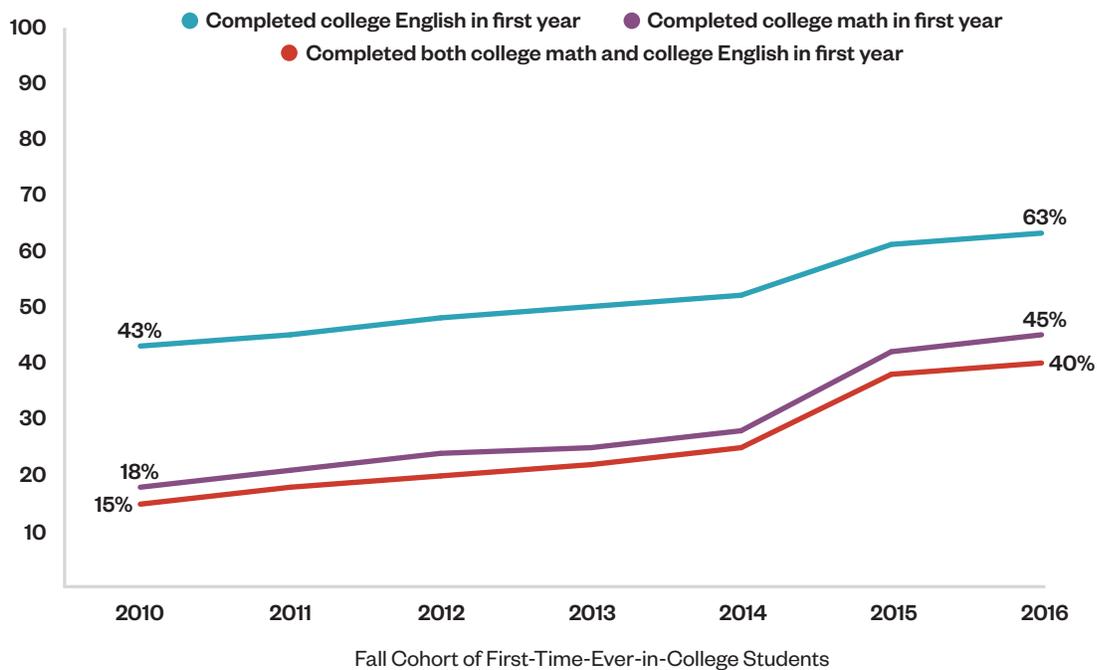


Gains in Gateway Course Completion and Persistence

Like the credit momentum KPIs, the gateway course completion KPIs for the 13 Tennessee community colleges improved steadily from 2010 to 2014 and showed larger improvements in 2015 and 2016. As shown in Figure 13 and Table B5, colleges made substantial improvements in the gateway course completion KPIs during the tracking period, with net average increases of 149, 47, and 165 percent in completion rates for college math, college English, and both courses in the first year, respectively. Only 15 percent of the fall 2010 cohort completed both college math and college English in their first academic year. This KPI increased 10 percentage points to 25 percent for the fall 2014 cohort, then jumped another 15 percentage points up to 40 percent for the fall 2016 cohort. During the period, there were small decreases in persistence from the first term to the second term and in course pass rates. (See Table B5.) The latter finding suggests that the substantial gains in the average number of credits accumulated by students were likely not the result of faculty lowering standards and passing many more students.

“ The gateway course completion KPIs for the 13 Tennessee community colleges improved steadily from 2010 to 2014 and showed larger improvements in 2015 and 2016. ”

Figure 13.
Gateway Course Completion KPIs



TBR community colleges achieved strong improvements on the gateway course completion KPIs for Black and Hispanic students. For Black students, throughout the tracking period, gateway course completion increased 422, 150, and 516 percent for college math, college English, and both courses in the first year, respectively. However, at the end of the tracking period, there remained large equity gaps in gateway course completion between Black and White students (between 11 and 17 percentage points). Notably, from 2010 to 2016, the TBR community colleges reduced the Black–White gap in first-year college English completion by 18 percentage points, and the bulk of this gap reduction occurred between 2014 and 2015, but there was still an 11-percentage-point gap for the fall 2016 cohort. Furthermore, while overall rates of gateway math completion improved for Black students from 2010 to 2016, the Black–White gap remained largely unchanged. The colleges made substantial improvements in gateway course completion among Hispanic students, and because they started with smaller Hispanic–White gaps at the outset (compared with the Black–White gaps), they had more success closing these gaps. The fall 2016 cohort had only a 2-percentage-point Hispanic–White gap for each of the gateway course completion KPIs. (See Figures 14–16 and Table B6.)

Figure 14.
Proportion of Students Who Completed College Math in Their First Year by Race/Ethnicity

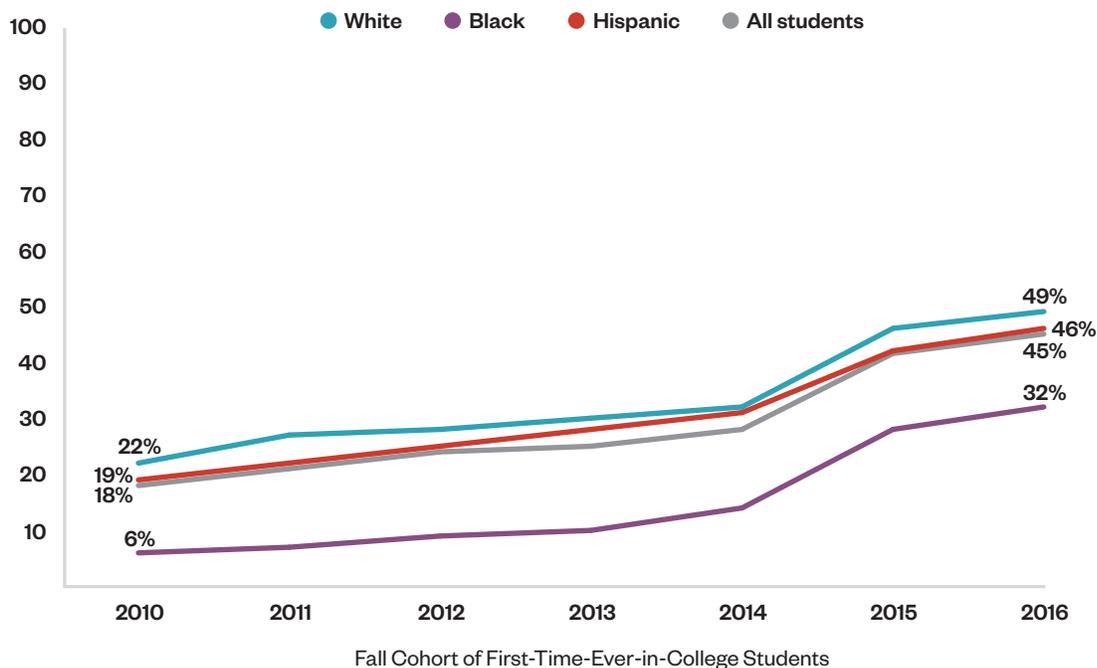


Figure 15.
Proportion of Students Who Completed College English in Their First Year by Race/Ethnicity

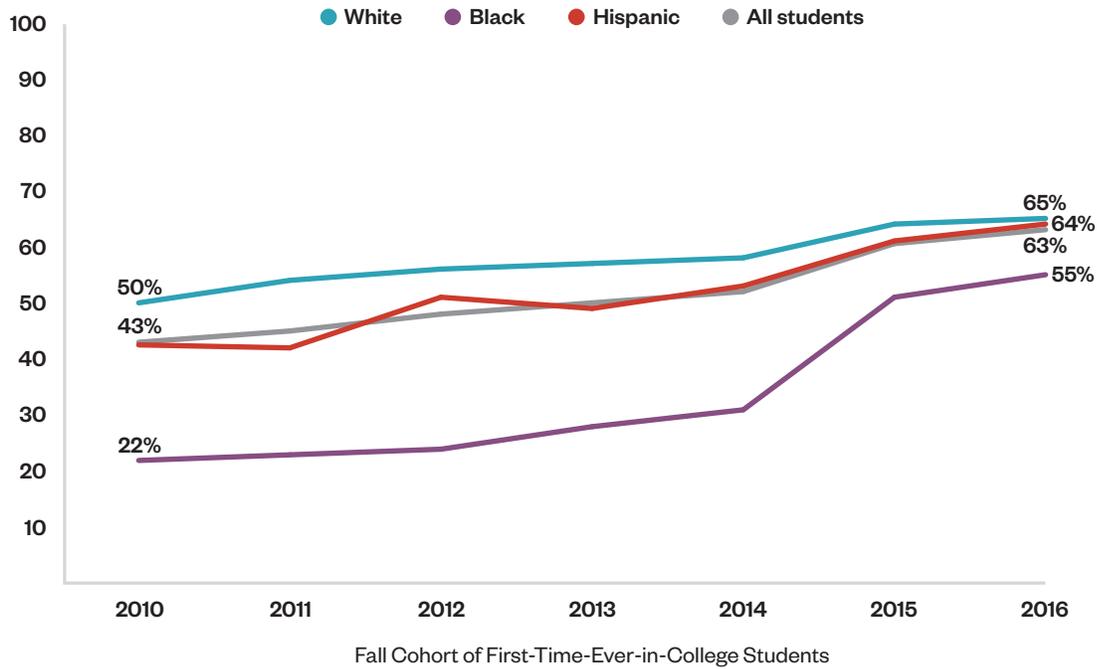
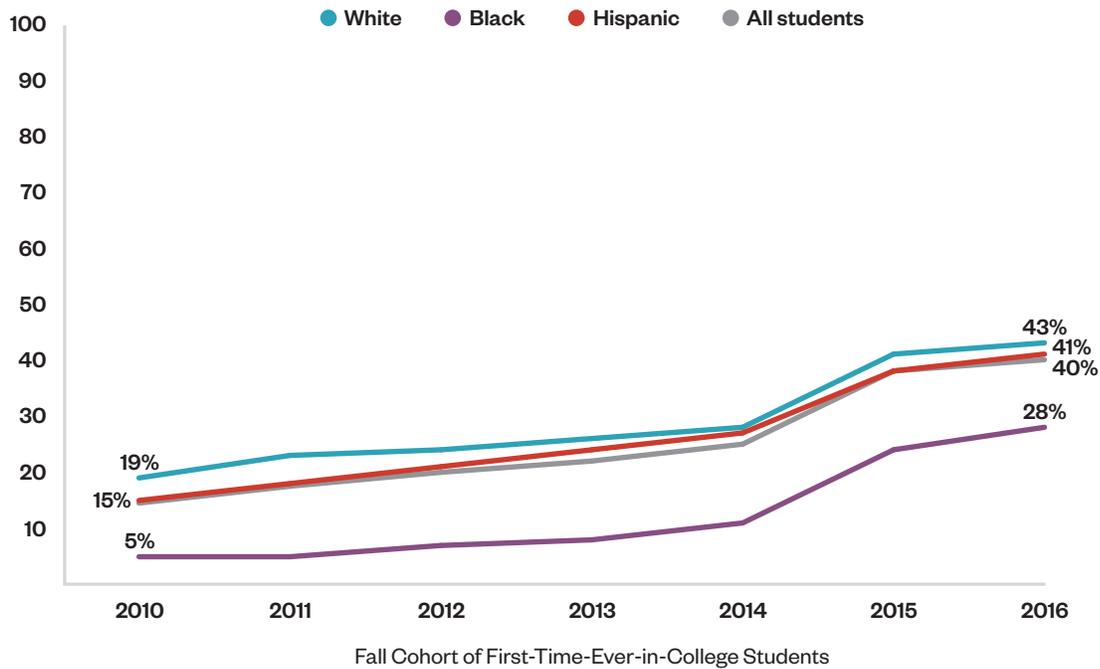


Figure 16.
Proportion of Students Who Completed Both College Math and College English in Their First Year by Race/Ethnicity



As shown in Figures 17–19 and Table B7, the TBR community colleges made substantial improvements in the share of students of all ages completing college math in their first year. Improvements in college English completion, meanwhile, were more modest for older students than for younger students. From 2010 to 2016, among students aged 25 or older in their first year, college math completion increased 226 percent, and completion of both college math and college English increased 222 percent, but college English completion increased only 16 percent. The percentage increases for college math completion shown in Table B7 are high relative to those for college English completion because the math completion KPIs were much lower to begin with. Figures 17–19 show the trends in gateway course completion by age subgroup. Overall, from 2010 to 2016, college English completion in the first year increased substantially for younger students and increased modestly for students aged 25 or older, whereas the trend lines for first-year college math completion are similar across age subgroups, notwithstanding the gaps between them.

Figure 17.
Proportion of Students Who Completed College Math in Their First Year by Age

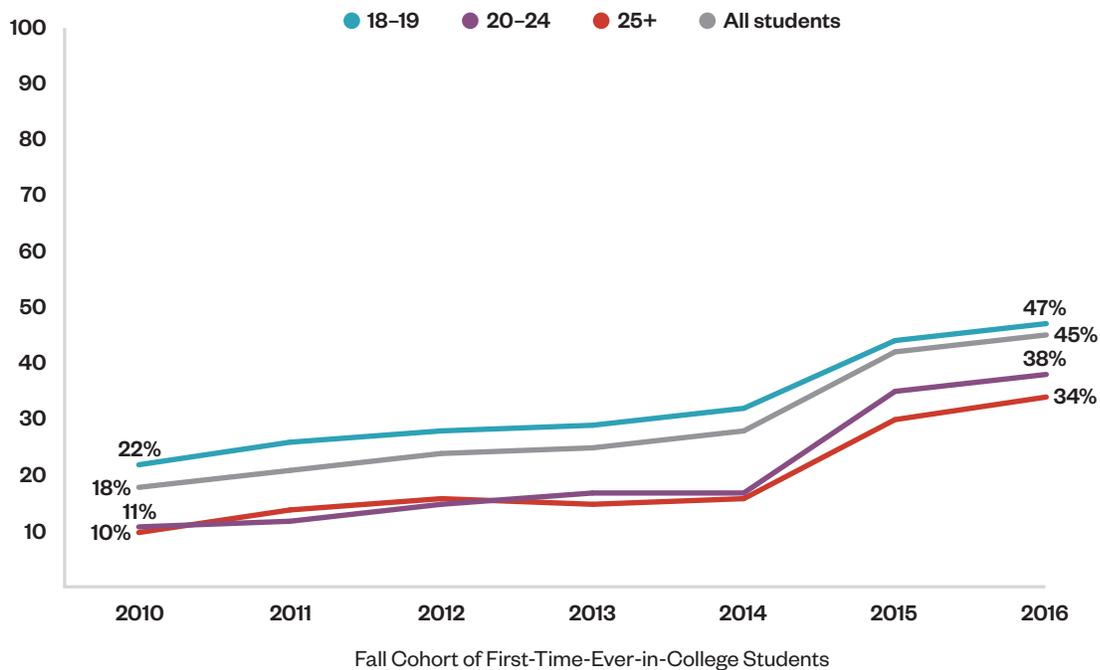


Figure 18.

Proportion of Students Who Completed College English in Their First Year by Age

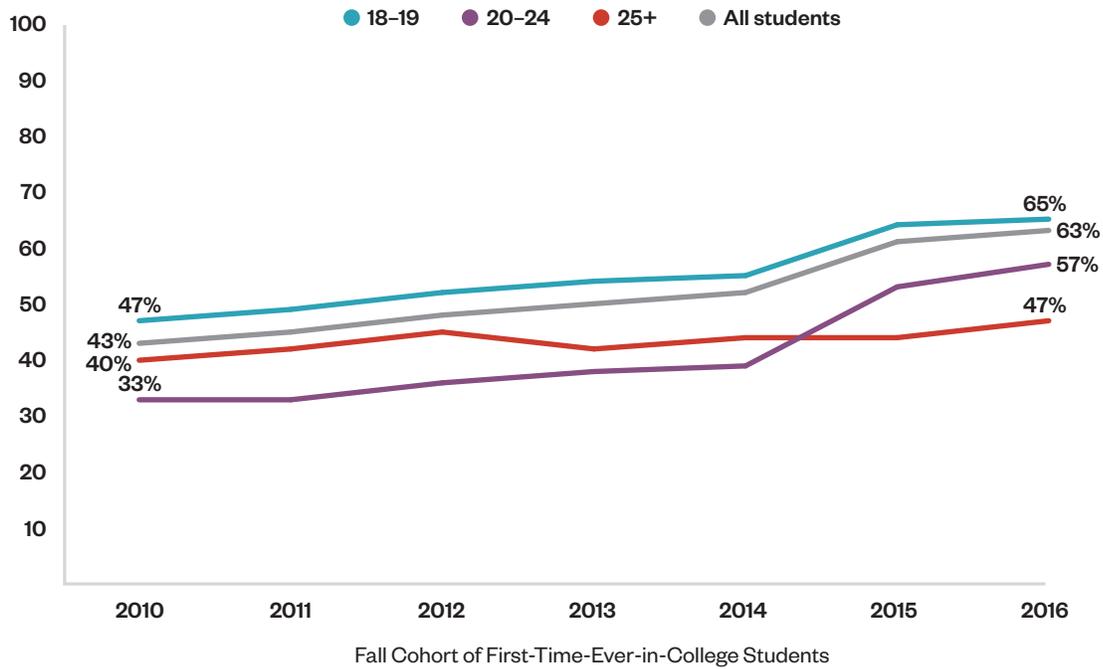
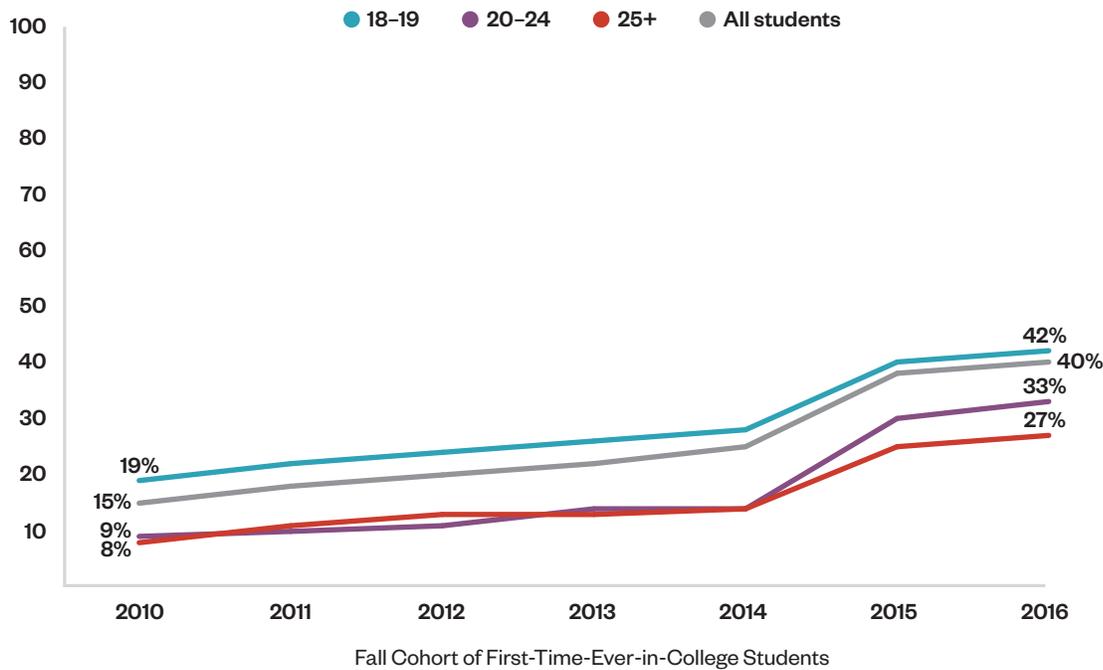


Figure 19.

Proportion of Students Who Completed College Math and College English in Their First Year by Age



**The Tennessee
community colleges are
committed to building
on and deepening the
improvements they
have made thus far.**



Next Frontiers for Improving Community College Completion in Tennessee

As is evident from the many examples presented in this report, the Tennessee community colleges have implemented a coordinated set of reforms on an impressive scale to improve student learning and credential completion. And, although more research is needed on the precise causes, they have seen impressive gains in early student momentum, which are likely to translate into substantial increases in completion rates over time. To their credit, the colleges are committed to building on and deepening the improvements they have made thus far. Two areas of practice that were not described yet in this report but that the Tennessee community colleges indicate are high priorities for the next frontier of their reforms are (1) better supporting returning adult learners and (2) helping students explore career and college options while they are still in high school.

Supporting Returning Adult Learners

Governor Bill Haslam's Tennessee Reconnect policy, which offers last-dollar tuition support for returning adult students, goes into effect in fall 2018. The number of applicants for Tennessee Reconnect scholarships is far exceeding preliminary estimates. As a result, the Tennessee community colleges are working to ensure that these students are well supported when they matriculate. As described in the previous section, on average, adult students in the Tennessee community colleges (as in most community colleges nationally) have poorer outcomes than younger students do. The colleges have recognized this and are taking steps to better serve adult students, including not only Tennessee Reconnect students but also veterans and other returning adults.

As a pilot college for the program, **Southwest Tennessee** had around 100 Tennessee Reconnect students enrolled in summer 2018 and has worked to scale its services for adult students by the fall semester. The college's enrollment specialists contacted incoming Tennessee Reconnect students directly this past spring and summer to help them complete their applications and enrollment processes. The college is also in the process of expanding its program learning outcomes to consider the needs of adult students, and it plans to enhance advising for adults. Because of its proximity to military bases, Southwest Tennessee has many veteran students and expects adult enrollment to continue growing.

Walters State is offering 10-week, tuition-free workshops for adult students who plan to enroll through Tennessee Reconnect. To accommodate adult students' schedules, the college offers day and evening workshops, during which students can complete their learning support requirements in math, writing, and reading so that they can begin their first term taking college-level courses. If students pass the end-of-workshop

exams, they can earn prior learning assessment credit, and if they do not pass, they may be able to test out of learning support courses through Accuplacer. Nearly 300 students participated in these workshops from fall 2017 through summer 2018, and the college plans to offer learning support academies for all incoming students in summer 2019 that adult learners can participate in.

Pellissippi State, another Tennessee Reconnect pilot college, reported a 44 percent increase in adult and online enrollments in the last year. The college developed a weekend block schedule for Tennessee Reconnect students and has a dedicated success coordinator for students aged 25 or older. As of spring 2018, students can take a semester of coursework by attending classes on Saturdays. Since 2012, the college has offered accelerated pathway cohorts, and a total of 600 students have completed their degree or certificate this way. The college currently has cohort options in seven programs, including management and welding technology. Most cohort programs can be completed in 16–24 months by attending courses two evenings per week in five- or 10-week sessions. The college reports an 85 percent completion rate for most cohorts. During the 2017–18 academic year, 284 Tennessee Reconnect students were enrolled in cohort programs. As adult enrollments have increased at Pellissippi State, some programs have had to offer two cohorts to respond to demand, and the college anticipates upcoming challenges in faculty availability to sustain multiple cohorts. Additionally, the college provides special supports to veterans through its veterans services programs and Veterans Success Center. Along with seven other TBR community colleges, Pellissippi State has received TN Veterans Education Transition Support (VETS) Campus certification.



Pellissippi State reported a 44 percent increase in adult and online enrollments in the last year.

Helping High School Students Explore College and Careers

The Tennessee Department of Education has made improving postsecondary success for high school students a policy priority. In response, Tennessee school districts have increased their collaboration with the Tennessee community colleges to expand opportunities for high school students to take college courses and otherwise improve their readiness for college. Many TBR community colleges are offering courses and support services to help high school students earn college credits early, complete their college applications and financial documents, and enroll. Additionally, all TBR community colleges help local students who are not on track to be college-ready in math complete developmental math while still in high school through the Seamless Alignment and Integrated Learning Support (SAILS) program.

Recognizing that students' motivation and goal orientation are as important for college readiness as academic readiness, the Tennessee community colleges have expanded their efforts to help students explore career and college options while they are still in high school. One of **Roane State's** partner high schools is using enlarged reproductions of some of the college's program maps as posters in its

hallways to increase students' familiarity with the college's programs and the paths that students would need to follow to complete them. A few colleges, including **Southwest Tennessee** and **Walters State**, administer career assessments to high school students and help them explore college programs and career options.

Students in **Chattanooga State's** high school academies are required to take a college success course, in which they explore career interests and develop an academic plan to pursue those interests in college. **Cleveland State** offers a course taught by Cleveland State faculty for students in their last semester of high school who are undecided about their future pathway. The course is an adaptation of the college's required first-year seminar, allowing students who did not meet the entrance requirements for dual enrollment courses to develop plans for college and ideally motivating them to enroll. Similarly, **Volunteer State** is planning to offer its college success courses with all prerequisites removed, which will enable high school students to pay for these courses using dual enrollment funding. The college hopes that by completing these courses, students will be able to enter with career and college exploration and planning experience. The college plans to scale these course offerings to all area high schools.



Students in Chattanooga State's high school academies are required to take a college success course, in which they explore career interests and develop an academic plan to pursue those interests in college.

Other colleges help high school students actively explore career and program interests through academies and dual enrollment offerings linked to their programs. For example, **Columbia State** offers collegiate academies at Columbia Central High School that introduce students to college-level coursework, along with activities that help them develop a "postsecondary mindset." Columbia State has offered to expand these academies to other high schools in the region. The college is also working with local hospital administrators to structure the academies and course offerings more purposefully so that students interested in healthcare can take relevant dual enrollment courses that count toward Columbia State's health sciences programs. **Pellissippi State** partners with local K-12 systems to offer a wide range of dual enrollment and dual credit courses, providing high school students with the opportunity to earn college credits and, for some, earn their associate degree by high school graduation. One high school, the Career Magnet Academy, is housed on a Pellissippi State campus and supports students to explore career options beginning in ninth grade. Students have the option to focus on specific career fields, such as cyber defense, advanced manufacturing, and teacher education.

Several of the colleges indicated that they are particularly concerned with reaching high school students from groups that are underrepresented in higher education. Colleges believe that focusing on underrepresented high school students is an important strategy for closing gaps in college success by race and ethnicity of the kind we reported in the last section (as well as gaps in success by family income, which the colleges have observed but which were not the focus of our analysis).

Other Future Directions for Research and Practice

The institutional reforms that the Tennessee community colleges have implemented over the past several years have required them to make fundamental changes not only in practice but also in college culture. Achieving these changes required strong leadership—as well as a prodigious amount of work—from faculty, staff, and administrators at all levels of these institutions. Several colleges indicated that they are thinking about how to sustain that level of innovation in the face of personnel turnover and fiscal uncertainty. Therefore, in addition to planning further improvements to practice as part of their completion reforms, these colleges are rethinking their approaches to hiring and professional development, college finance, and other functions that are critical to supporting innovation in practice over time.

CCRC will continue to study the efforts of the Tennessee community colleges to implement completion reforms and plans to administer the Scale of Adoption Assessment to all 13 colleges in 2019 and 2020. CCRC will also continue to use unit record data from TBR to examine whether the colleges' early momentum KPIs continue to improve and whether these indicators lead to improved completion rates and further narrowing of equity gaps over time. Using these two data sources together, we will attempt to disentangle the effects of innovations in college practice and changes in student composition on KPIs. CCRC will also seek to identify early momentum KPIs for returning/continuing students and dual enrollment students, who were not included in the current report's KPI analysis. Finally, CCRC will work with TBR and the Tennessee community colleges to measure the costs of the completion reforms they are undertaking and assess their cost-benefits for students, colleges, and taxpayers.

Endnotes

1. We are using the early momentum KPIs with more than 100 community colleges across numerous states both to assess the early effects of guided pathways reforms and to inform conversations about continuous improvement.
2. Racial/ethnic composition remained largely unchanged throughout the tracking period: About two thirds of TBR community college students were White, about one fifth were Black, and about 5 percent were Hispanic. About 5–10 percent belonged to other racial/ethnic groups.

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Appendix A:

Qualitative Methodology

To learn about how the Tennessee community colleges are designing and implementing completion practices, we administered a version of CCRC’s Scale of Adoption Assessment (SOAA) that outlines 20 essential practices grouped under the four main areas of the guided pathways model. For each practice, the SOAA asks colleges to describe their implementation progress to date, their next steps for taking the practice to scale (for all students in all programs of study), and their timeline for doing so. The SOAA also asks colleges to indicate the extent to which they have implemented each practice using a five-point scale ranging from *not occurring* to *at scale*.

The SOAA, rather than prescribing highly specific reforms, “uses easy-to-understand language to describe practices that colleges can accomplish in any number of ways,” (Lahr, 2018)—and states have taken a number of different approaches to guided pathways reforms based on their goals and objectives. Accordingly, CCRC worked with TBR to customize the SOAA so that it included certain practices that are specific to Tennessee, such as degree-completion plans, work with adult students, and high-impact practices. In fact, the guided pathways model and the Scale of Adoption Assessment were developed partly through CCRC’s research in Tennessee through a Lumina Foundation–funded project involving TBR and Complete College America.

The SOAA was distributed to the colleges in October 2017, with suggestions regarding who should be on the teams completing the SOAA and what types of information to include in their responses. CCRC recommended that the teams include faculty members and deans from transfer and career-technical programs, student services staff, and representatives from the offices of institutional research, information technology, the registrar, and financial aid.

All 13 colleges returned the completed SOAA form to TBR in December 2017, and CCRC conducted 90-minute follow-up calls with teams from each college in January 2018. These calls included two CCRC researchers: one who led the call and one who took notes. CCRC researchers used a call protocol with follow-up questions related to each of the 20 practices so that they could gain a deeper understanding of how the colleges were implementing the practices, as well as their successes and challenges. The protocol also included questions about when the colleges implemented practices at scale. We were particularly interested in the term in which a college implemented a practice at scale (or very nearly at scale), as this information would help us interpret the early momentum data.

In March 2018, the CCRC research team shared an internal report that summarized key findings with TBR and the 13 community colleges. We conducted a round of follow-up calls with colleges in June 2018 to clarify certain examples used in this report.

Appendix B:

Early Momentum KPI Analysis

To conduct our analysis of early momentum KPIs, we obtained transcript-level student data from fall 2010 through spring 2017 from the TBR administrative database. The dataset comprises all students who enrolled at a TBR community college at least once during this period. Variables include information on students' demographics, financial aid, courses taken, grades earned, and credential(s) earned.

Students were included in the cohort for a particular year if they were enrolled for the first time in postsecondary education (i.e., had no previous college credits or degrees) in at least one course for credit (developmental or college-level) at a TBR community college during the fall term. The cohorts include both full- and part-time students but exclude current and former dual enrollment students. Entering fall cohort students were tracked through the following summer for the academic year KPIs, with the exception of the fall 2016 cohort students, who were tracked only through spring 2017 (the most recent term for which data were available from TBR for this analysis). Therefore, the academic year KPIs for the 2016 cohort included in this report underestimate the actual rates for their first full academic year.

Table B1 shows the definitions we used for each of the early momentum KPIs. Tables B2–B7 show the average trends in KPIs across the 13 Tennessee community colleges.

Table B1.
Early Momentum KPI Definitions

KPI	DEFINITION	
	Numerator	Denominator
Earned 6+ college credits in first term	Fall cohort students who earned 6 or more college-level credits (with grade A–D or P) in their first term	Fall cohort students
Earned 12+ college credits in first term	Fall cohort students who earned 12 or more college-level credits (with grade A–D or P) in their first term	Fall cohort students
Earned 15+ college credits in first year	Fall cohort students who earned 15 or more college-level credits (with grade A–D or P) in their first full academic year	Fall cohort students
Earned 24+ college credits in first year	Fall cohort students who earned 24 or more college-level credits (with grade A–D or P) in their first full academic year	Fall cohort students
Earned 30+ college credits in first year	Fall cohort students who earned 30 or more college-level credits (with grade A–D or P) in their first full academic year	Fall cohort students
Attempted 15+ credits (any level) in first term	Fall cohort students who attempted 15 or more college-level or developmental credits in their first term	Fall cohort students
Attempted 30+ credits (any level) in first year	Fall cohort students who attempted 30 or more college-level or developmental credits in their first full academic year	Fall cohort students
Average credits attempted per student in first year	Total college-level credits attempted by fall cohort students in their first full academic year	Fall cohort students
Average credits earned per student in first year	Total college-level credits completed (with grade A–D or P) by fall cohort students in their first full academic year	Fall cohort students
Completed college math in first year	Fall cohort students who attempted and passed at least one college-level math course (with grade A–D or P) in their first full academic year*	Fall cohort students
Completed college English in first year	Fall cohort students who attempted and passed at least one college-level English course (with grade A–D or P) in their first full academic year*	Fall cohort students
Completed both college math and college English in first year	Fall cohort students who attempted and passed at least one college-level course (with grade A–D or P) in both math and English in their first full academic year*	Fall cohort students
Persisted from first term to second term	Fall cohort students who enrolled in at least one credit-bearing course (including developmental) in their second term (spring term)	Fall cohort students
College credit pass rate	Total college-level credits completed (with grade A–D or P) by fall cohort students in their first full academic year	Total college-level credits attempted by fall cohort students in their first full academic year

Note: “College-level” credits refer to nonremedial credits.

* Withdrawals should be counted as attempting but not passing the course.

Table B2.
Changes in Credit Momentum KPIs, 2010–2016 Fall Cohorts

KPI	COHORT				PERCENT CHANGE, 2010–2016	PERCENTAGE POINT CHANGE, 2010–2016
	2010	2012	2014	2016		
Attempted 15+ credits (any level) in first term	14%	13%	15%	36%	157%	22 pp
Attempted 30+ credits (any level) in first year	14%	11%	12%	18%	27%	4 pp
Earned 6+ college credits in first term	42%	47%	52%	67%	61%	25 pp
Earned 12+ college credits in first term	13%	16%	21%	30%	136%	17 pp
Earned 15+ college credits in first year	32%	36%	40%	49%	53%	17 pp
Earned 24+ college credits in first year	12%	14%	18%	24%	101%	12 pp
Earned 30+ college credits in first year	3%	4%	5%	6%	72%	2 pp
Average credits attempted per student in first year	14.1	15.0	16.2	19.4	38%	5.3 credits
Average credits earned per student in first year	10.0	10.8	11.7	13.7	36%	3.7 credits

Table B3.
Changes in Credit Momentum KPIs by Race/Ethnicity and Remaining Equity Gaps

KPI	PERCENT CHANGE, 2010–2016 COHORTS			PERCENTAGE POINT GAP, 2016 COHORT	
	White	Black	Hispanic	Black-White	Hispanic-White
Attempted 15+ credits (any level) in first term	143%	239%	118%	12 pp	11 pp
Attempted 30+ credits (any level) in first year	36%	-8%	0%	9 pp	5 pp
Earned 6+ college credits in first term	42%	197%	74%	19 pp	4 pp
Earned 12+ college credits in first term	116%	421%	152%	24 pp	11 pp
Earned 15+ college credits in first year	40%	143%	71%	21 pp	6 pp
Earned 24+ college credits in first year	89%	178%	104%	19 pp	8 pp
Earned 30+ college credits in first year	64%	53%	73%	6 pp	2 pp
Average credits attempted per student in first year	30%	76%	38%	4.9 credits	2.5 credits
Average credits earned per student in first year	29%	73%	42%	5.3 credits	1.4 credits

Table B4.
Changes in Credit Momentum KPIs by Age and Remaining Equity Gaps

KPI	PERCENT CHANGE, 2010–2016 COHORTS			PERCENTAGE POINT GAP, 2016 COHORT	
	18–19	20–24	25+	20–24 / 18–19	25+ / 18–19
Attempted 15+ credits (any level) in first term	135%	115%	34%	20 pp	31 pp
Attempted 30+ credits (any level) in first year	38%	-19%	-65%	12 pp	15 pp
Earned 6+ college credits in first term	51%	81%	37%	12 pp	20 pp
Earned 12+ college credits in first term	100%	156%	103%	16 pp	21 pp
Earned 15+ college credits in first year	44%	71%	7%	15 pp	23 pp
Earned 24+ college credits in first year	88%	98%	-12%	15 pp	19 pp
Earned 30+ college credits in first year	84%	1%	-53%	5 pp	5 pp
Average credits attempted per student in first year	34%	37%	0%	4.6 credits	8.1 credits
Average credits earned per student in first year	31%	44%	3%	3.5 credits	4.9 credits

Table B5.

Changes in Gateway Course Completion and Persistence KPIs, 2010–2016 Fall Cohorts

KPI	COHORT				PERCENT CHANGE, 2010–2016	PERCENTAGE POINT CHANGE, 2010–2016
	2010	2012	2014	2016		
Completed college math in first year	18%	24%	28%	45%	149%	27 pp
Completed college English in first year	43%	48%	52%	63%	47%	20 pp
Completed both college math and college English in first year	15%	20%	25%	40%	165%	25 pp
Persisted from first term to second term	76%	74%	73%	73%	-4%	-3 pp
College credit pass rate	71%	72%	72%	70%	-1%	-1 pp

Table B6.

Changes in Gateway Course Completion and Persistence KPIs by Race/Ethnicity and Remaining Equity Gaps

KPI	PERCENT CHANGE, 2010–2016 COHORTS			PERCENTAGE POINT GAP, 2016 COHORT	
	White	Black	Hispanic	Black–White	Hispanic–White
Completed college math in first year	120%	422%	142%	17 pp	2 pp
Completed college English in first year	30%	150%	47%	11 pp	2 pp
Completed both college math and college English in first year	131%	516%	175%	15 pp	2 pp
Persisted from first term to second term	-4%	-4%	-5%	6 pp	3 pp
College credit pass rate	-1%	-1%	3%	11 pp	-2 pp

Table B7.

Changes in Gateway Course Completion and Persistence KPIs by Age and Remaining Equity Gaps

KPI	PERCENT CHANGE, 2010–2016 COHORTS			PERCENTAGE POINT GAP, 2016 COHORT	
	18–19	20–24	25+	20–24 / 18–19	25+ / 18–19
Completed college math in first year	108%	259%	226%	8 pp	13 pp
Completed college English in first year	40%	71%	16%	8 pp	19 pp
Completed both college math and college English in first year	121%	283%	222%	9 pp	15 pp
Persisted from first term to second term	-4%	-2%	-21%	8 pp	16 pp
College credit pass rate	-2%	5%	3%	2 pp	-6 pp

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