Office of Research and Education Accountability

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Learning Support in Tennessee's Public Colleges and Universities

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Key Points

- Roughly two-thirds of all first-time freshmen in the fall of 2016 arrived at Tennessee's public colleges and universities with ACT scores indicating they had academic deficiencies in one or more subject areas. Exhibit 3 on page 5 shows the percent of first-time freshmen in 2016 with academic deficiencies in one or more subject areas at each of Tennessee's public higher education institutions.

- Public higher education institutions across Tennessee offer students who have subject-area deficiencies extra academic assistance – called learning support – designed to ensure their success in entry-level college courses. The more college credit a student earns in the first year of enrollment, the more likely that student is to earn a postsecondary credential. Thus, succeeding with learning support is linked to increasing the number of Tennesseans with a postsecondary credential.

- The percent of first-time freshmen whose ACT scores qualified them for learning support decreased from 2010 to 2016, though remained largely the same from 2013 through 2016.

- Since 2010 several programs have been implemented to allow students whose ACT scores qualify them for learning support the chance to receive extra academic assistance before enrolling in their first semester of college. Such programs include Seamless Alignment and Integrated Learnings Support (SAILS) and Summer Bridge. Between 2010 and 2016, the percent of first-time freshmen who required learning support at one of Tennessee's community colleges has decreased by 15 percentage points, and this decrease is most likely the result of students increasingly taking advantage of SAILS and Summer Bridge programs.

- Public higher education institutions have implemented new methods of learning support to improve student success rates. Although high overall, success rates for students enrolled in learning support vary by higher education institution, course, subject, and student type. See pages 13, 14, and 18 for exhibits highlighting the variation in learning support success among Tennessee's colleges and universities.

- OREA's analysis identified institutions with higher success rates of students completing gateway courses, despite students' similar demographic characteristics (or similar risk factors for non-completion). Further analysis of the factors leading to these higher success rates and sharing of best practices would continue to help improve student success rates.

Learning Support Defined

Learning support refers to extra academic assistance provided by postsecondary institutions to students who arrive on campus academically underprepared in core subjects like math, reading, and writing. Learning support is designed to help students become proficient in the academic skills they need to be successful in credit-bearing, college-level coursework. Learning support can take different forms, including additional coursework, more face-to-face time with an instructor, peer tutoring, or computer lab-based independent study.

For this report, OREA uses *learning support* as an umbrella term for several forms of academic assistance previously or currently offered in Tennessee, as shown in Exhibit 1. Although *remediation* is also a term used to describe various types of assistance given to academically underprepared students, as policies have changed, the terminology has shifted toward the use of the term learning support to describe the variety of assistance now given in Tennessee's public colleges and universities. (See pages 11 and 15 for a timeline of policy changes.)

Exhibit 1: Learning supports in Tennessee

Learning Supports		
Prerequisite Remediation Under the prerequisite remediation model, students are required to take and pass a course designed to close skill gaps before being allowed to enroll in a college-level, credit-bearing course. Prerequisite remediation is no longer offered in Tennessee's public colleges or universities.	*Corequisite Model* The corequisite model is an intensive type of learning support offered in Tennessee's 13 community colleges. Under the corequisite model, students are enrolled in both a 3 credit hour college-level course and a 3 credit hour learning support course in the same subject at the same time.	*Supplemental Instruction* Supplemental instruction is a less intensive form of learning support offered in Tennessee's public four-year institutions. Students receive additional academic instruction, like extended class time, while enrolled in a 3 credit hour college-level course. The supplemental instruction is worth between 0 and 1 credit hours.

How do institutions decide if a student needs learning support?

Public higher education institutions in Tennessee primarily use ACT subject area test scores (subscores) in math, English, and reading to determine the entry level course a student takes in a certain subject (e.g., basic math, college algebra). Unless they have demonstrated subject area competency through other avenues, students who receive ACT subscores below the benchmarks set by their institutions are assigned to some form of learning support upon enrollment. (See alternative proficiency options described on page 9.)

Exhibit 2 shows the ACT subscore benchmarks used by Tennessee institutions to assign students to learning support. For example, a student at a community college with an ACT subscore below 19 in math would qualify for learning support. The Tennessee Board of Regents (TBR) uses the same ACT subscore benchmarks to assign all community college students to learning support. As of fall 2017, the state's six locally governed institutions[A] continue to use TBR's benchmarks to assign students to learning support. Each of the three institutions in the University of Tennessee (UT) system sets its own subject area

[A] The six locally governed institutions are East Tennessee State University (ETSU), Tennessee Technological University (TN Tech), Middle Tennessee State University (MTSU), Tennessee State University (TSU), Austin Peay State University (APSU), and the University of Memphis.

benchmarks. Two of the three UT institutions allow some flexibility in learning support placement. The University of Tennessee at Chattanooga (UT Chattanooga) suggests that students with an ACT English subscore below 21 have the best chance for success if they take an introductory English course with learning support. However, students may opt out of learning support through a self-placement policy. The University of Tennessee at Martin (UT Martin) considers students' ACT scores along with high school grade point averages (GPA) when assigning students to learning support in English.

Exhibit 2: Learning support placement thresholds, based on ACT subscore benchmarks

ACT Subject-Area Test	TBR	UT Knoxville	UT Chattanooga	UT Martin
Math	19	22	19	20
English	18	19 subscore + 19 composite	21	19 + GPA
Reading	19	NA	NA	21 subscore or 21 composite

Note: Subscores are scores for each of the ACT subject area tests. Composite is the average of the subject area test scores. Scores for subject area tests and composite averages range from 1 to 36. N/A means that subscores for that subject are not considered when assigning students to learning support.
Sources: ACT subscore benchmarks were compiled from interviews with institutions, as well as publicly available documentation.

Research shows that relying on a single measure, as many Tennessee colleges and universities do with the ACT, may cause over- or under-placement of students into learning support. The same research shows that using multiple measures to assign students to learning support results in more precise targeting of learning support to students who need it.[1] As of spring 2018, TBR and the Tennessee Department of Education are researching the use of multiple measures – such as a combination of ACT, high school GPA, high school end-of-course exams, and alternative placement exams – when assigning students to learning support.

Unlike other postsecondary institutions, Tennessee's Colleges of Applied Technology (TCATs) do not assess academic preparedness based on ACT scores. TCATs most often use the Technology Foundation assessment to determine a student's skill level in math, reading, language and communication, and locating information in texts.[B] Because each TCAT program has unique skill requirements and students are usually able to close skills gaps in their own time through computer-based learning, TCATs are not included in the following analysis.[C]

The Need for Learning Support in Tennessee

What percentage of first-time freshmen qualified for learning support in 2016?

To determine how many first-time freshmen (FTF) qualify for learning support in public higher education institutions, OREA acquired ACT data from the Tennessee Higher Education Commission for all students who were first-time freshmen in fall 2016. Only first-time freshmen with complete and valid

[B] Health Science programs, such as practical nursing, often have other placement exams.
[C] For more information about TCATs, see *Tennessee Colleges of Applied Technology: A Primer*, OREA, 2016.

ACT scores were included.[D]

Exhibit 3 shows the percentage of first-time freshmen at each of Tennessee's public institutions with ACT scores that qualified them for learning support, according to the benchmarks set by their chosen institution. "Count of all FTF" is the total number of first-time freshmen enrolled in each institution, while the percentages represent the students who qualified for learning support in each subject. For example, 66 percent of the 1,428 first-time freshmen at Chattanooga State arrived at college with an ACT subscore that qualified them for learning support in math.

Exhibit 3: Percent of first-time freshmen (FTF) whose ACT scores qualified them for learning support in one or more subject areas, by system and institution, 2016

TBR Community Colleges, 2016	Count of All FTF	Math	English	Reading	Any Need
Chattanooga State Community College	1,428	66%	45%	44%	76%
Cleveland State Community College	668	68%	45%	45%	78%
Columbia State Community College	1,323	59%	33%	36%	69%
Dyersburg State Community College	521	71%	43%	47%	78%
Jackson State Community College	963	71%	49%	51%	80%
Motlow State Community College	1,672	69%	43%	43%	77%
Nashville State Community College	1,377	80%	58%	56%	85%
Northeast State Community College	1,171	63%	40%	41%	74%
Pellissippi State Community College	2,095	58%	31%	33%	66%
Roane State Community College	1,180	64%	39%	39%	73%
Southwest Tennessee Community College	1,913	86%	68%	67%	91%
Volunteer State Community College	1,915	68%	45%	45%	76%
Walters State Community College	1,377	62%	40%	40%	71%
Community College Total	**17,603**	**68%**	**45%**	**45%**	**76%**
Locally Governed Four-Year Institutions, 2016	**Count of All FTF**	**Math**	**English**	**Reading**	**Any Need**
Austin Peay State University	1,728	47%	23%	23%	58%
East Tennessee State University	1,608	32%	16%	18%	40%
Middle Tennessee State University	2,593	39%	18%	20%	47%
Tennessee State University	1,097	79%	57%	54%	86%
Tennessee Technological University	1,456	21%	8%	11%	29%
University of Memphis	2,510	45%	21%	23%	52%
Locally Governed Institutions Total	**10,992**	**42%**	**22%**	**23%**	**50%**

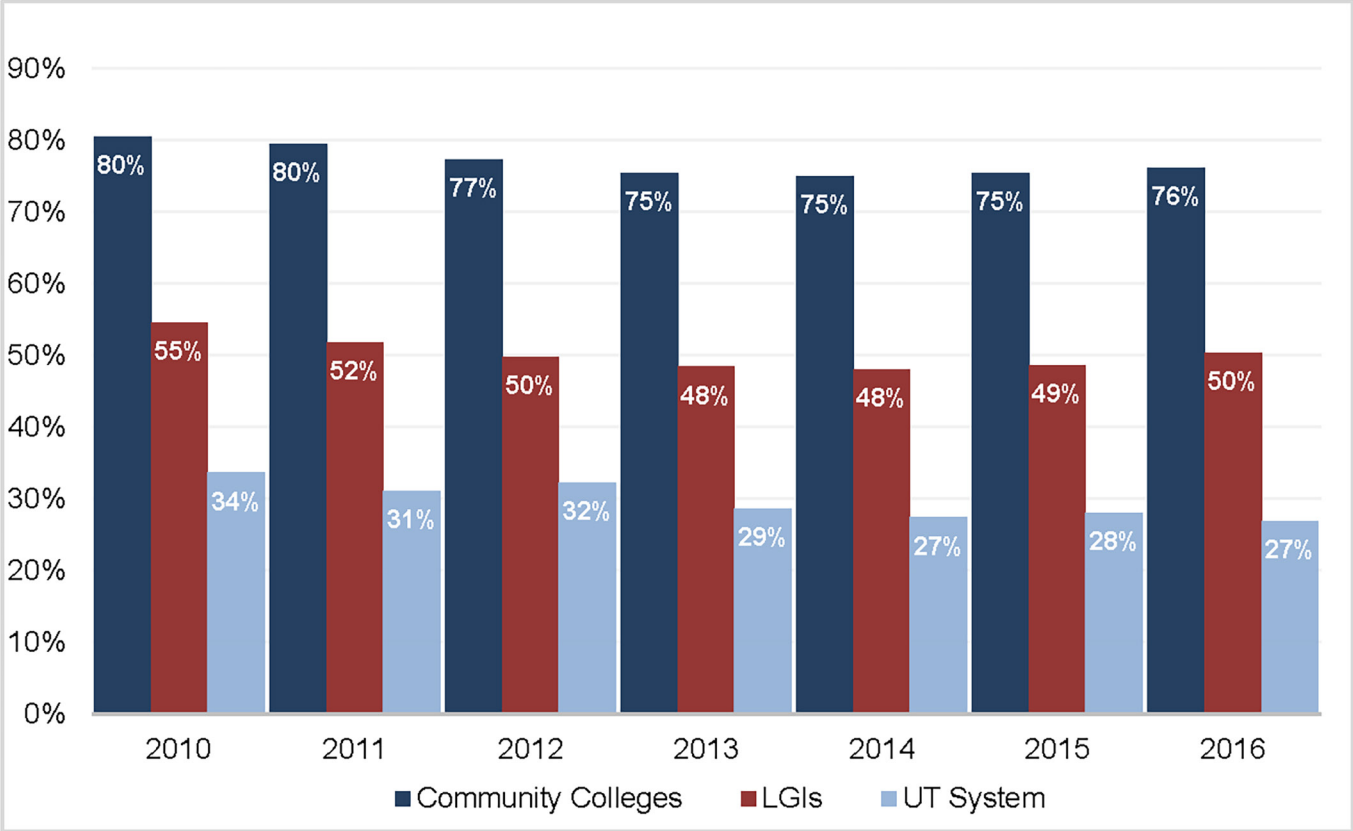
[D] "Complete and valid scores" refers to students for which composite scores were correctly calculated, and for which all four subscores (Reading, Math, English, and Science) were reported.

University of Tennessee Four-Year Institutions, 2016	Count of All FTF	Math	English	Reading	Any Need
University of Tennessee, Chattanooga	1,957	26%	27%	N/A	40%
University of Tennessee, Knoxville	4,261	17%	3%	N/A	18%
University of Tennessee, Martin	837	37%	16%	19%	42%
University of Tennessee Total	**7,055**	**22%**	**11%**	**N/A**	**27%**

How has qualification for learning support based on ACT scores changed over time?

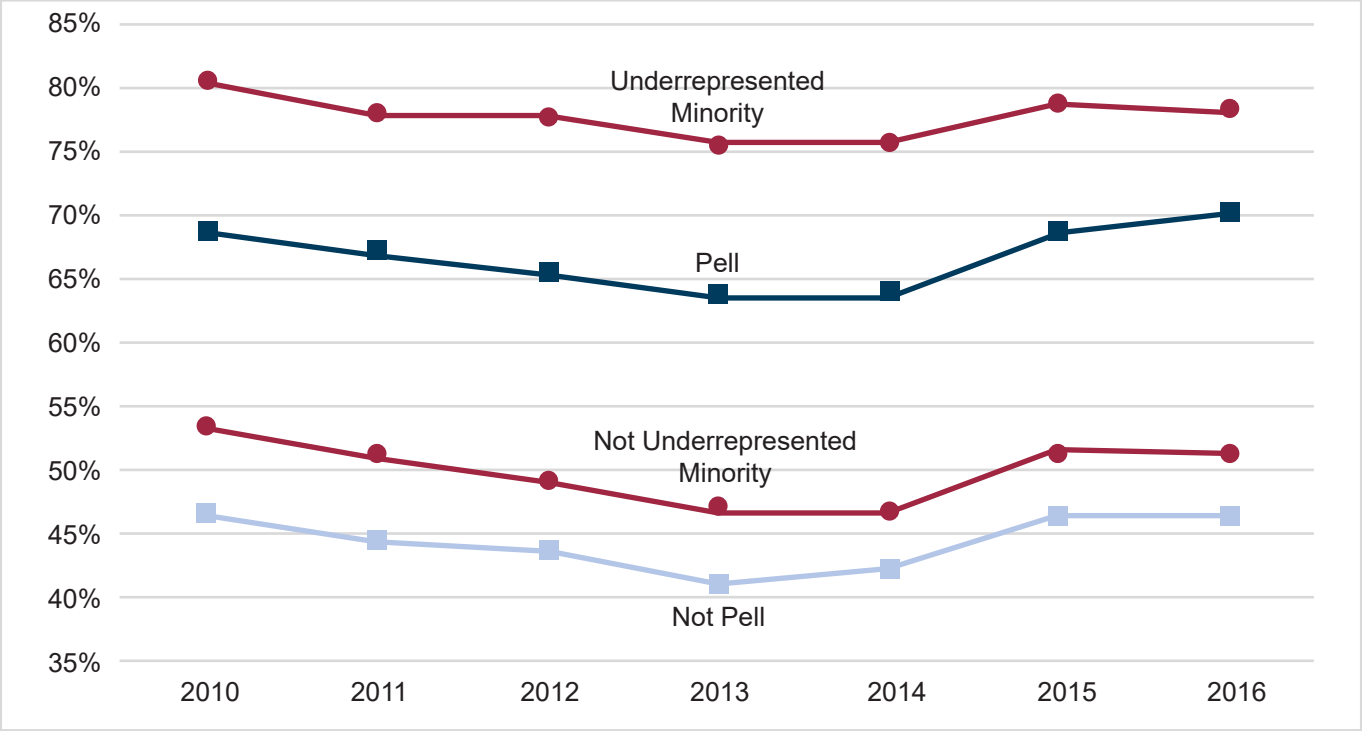
Between 2010 and 2016, the percentage of first-time freshmen whose ACT scores qualified them for learning support has declined overall, but from 2013 through 2016, the percentage of students who qualified for learning support has remained relatively steady across all types of public higher education institutions in Tennessee. (See Exhibit 4.)

Exhibit 4: Percent of first-time freshmen whose ACT scores qualified them for learning support, by institution type, 2010 – 2016



In the same time span, using the same ACT benchmarks, first-time freshmen from certain demographic groups were more likely than others to receive ACT scores that qualified them for learning support. In 2016, there was a 23-percentage point gap between Pell-eligible students who qualified for learning support and their peers who are not Pell-eligible.[E] In the same year, there was also a 28-percentage point gap between underrepresented minority students who qualified for learning support and their peers. (See Exhibit 5.) Underrepresented minority students are African American, Hispanic, and Alaskan/Native American students.[F]

Exhibit 5: Percent of first-time freshmen whose ACT scores qualified them for learning support, by student groups, 2010 – 2016



[E] The Federal Pell Grant Program provides need-based grants to low-income undergraduate and postbaccalaureate students to promote access to postsecondary education. Pell eligibility is determined by the U.S. Department of Education using a standard formula, established by Congress, to evaluate the financial information reported on the Free Application for Federal Student Aid (FAFSA). According to the Tennessee Higher Education Commission, single year Pell eligibility is not tracked. Rather, students who were eligible, as indicated on the FAFSA, for the Pell Grant at any point in their college careers are designated as "ever Pell-eligible." Since the data used in this report includes only first-time freshmen, Pell data includes only students who were currently eligible.
[F] The Tennessee Board of Regents data collection system categorizes these racial/ethnic subgroups of students as "underrepresented minority students."

Qualification for learning support: before and after Tennessee Promise

The Tennessee Promise is a scholarship and mentoring program that provides a last-dollar scholarship for high school graduates seeking a degree or certificate at a community college, Tennessee College of Applied Technology (TCAT), or other eligible institution.

Key Takeaways:

- In 2015, the first full year of Tennessee Promise implementation, first-time freshmen enrollment in Tennessee's community colleges increased by almost 25 percent.
- As overall enrollment increased, enrollment of students within all possible ACT score ranges – including scores that qualify a student for learning support – increased as well. (See Exhibit 6.)
- In 2015, 3,925 more students with ACT scores that qualified them for learning support enrolled in Tennessee's community colleges compared to 2014. (See Exhibit 7.)

Although there was an increase in the number of students whose ACT score qualified them for learning support in 2015, those students made up about the same percent of their freshmen class as those in 2014. (See Exhibits 7 and 8.) This indicates that as overall enrollment increased after Tennessee Promise began, need for learning support increased proportionately.

Exhibit 6: Number of first-time freshmen enrollment by ACT score ranges in Tennessee community colleges, 2010 – 2016

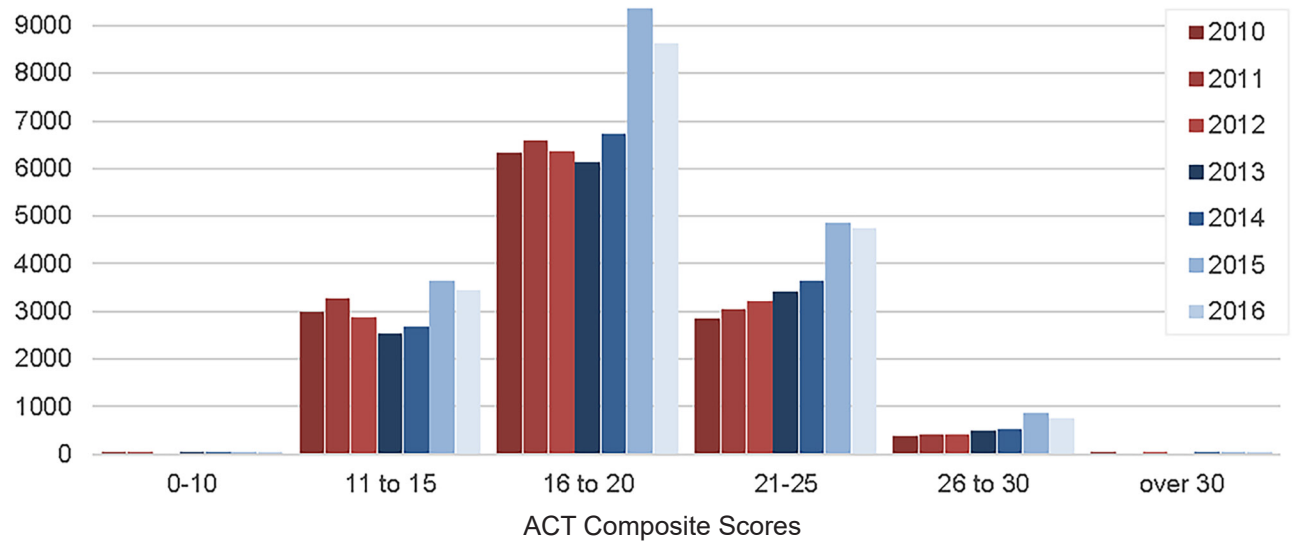


Exhibit 7: Number of first-time freshmen in community colleges whose ACT scores qualified them for learning support, 2010 – 2016

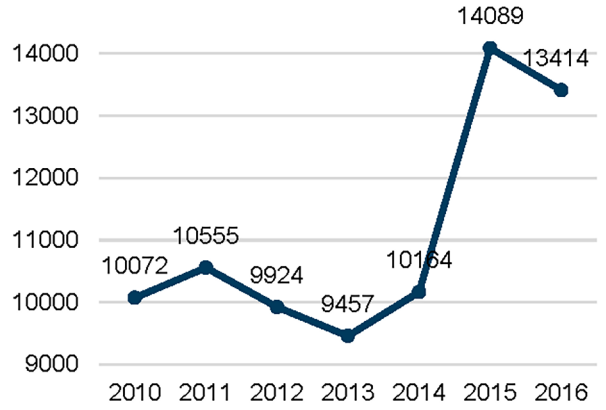
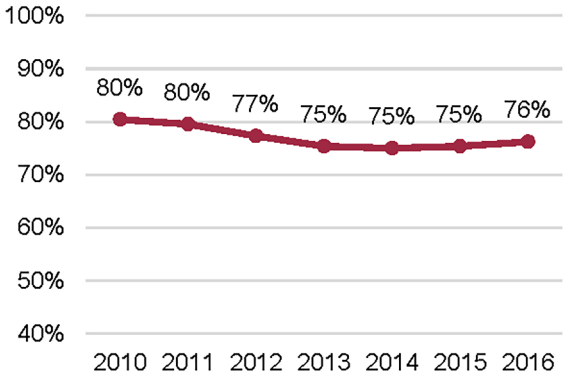


Exhibit 8: Percent of first-time freshmen in community colleges whose ACT scores qualified them for learning support, 2010 – 2016



Alternative Proficiency Options

First-time freshmen with ACT scores that qualify them for learning support are not always required to enroll in learning support. Students may demonstrate subject area proficiency through other avenues before, or soon after, they enroll. Students who successfully complete one or more of the following alternative proficiency options are not required to enroll in learning support:

Seamless Alignment and Integrated Learning Support (SAILS) – In place statewide since 2013, the SAILS program is a form of learning support for math that takes place during the senior year of high school. SAILS is offered to students who score below 19 on the math subsection of the ACT. Students who successfully complete the SAILS program are considered proficient in math and can enroll directly into a credit-bearing math course with no learning support at any of the state's 13 community colleges and some of the four-year universities.[G]

Summer programs – Some institutions offer programs in which underprepared students receive intensive learning support in the summer before beginning their first semester. These programs include the Summer Bridge program for community college students, the Step Ahead math program at UT Chattanooga, and Math Camp at UT Knoxville.

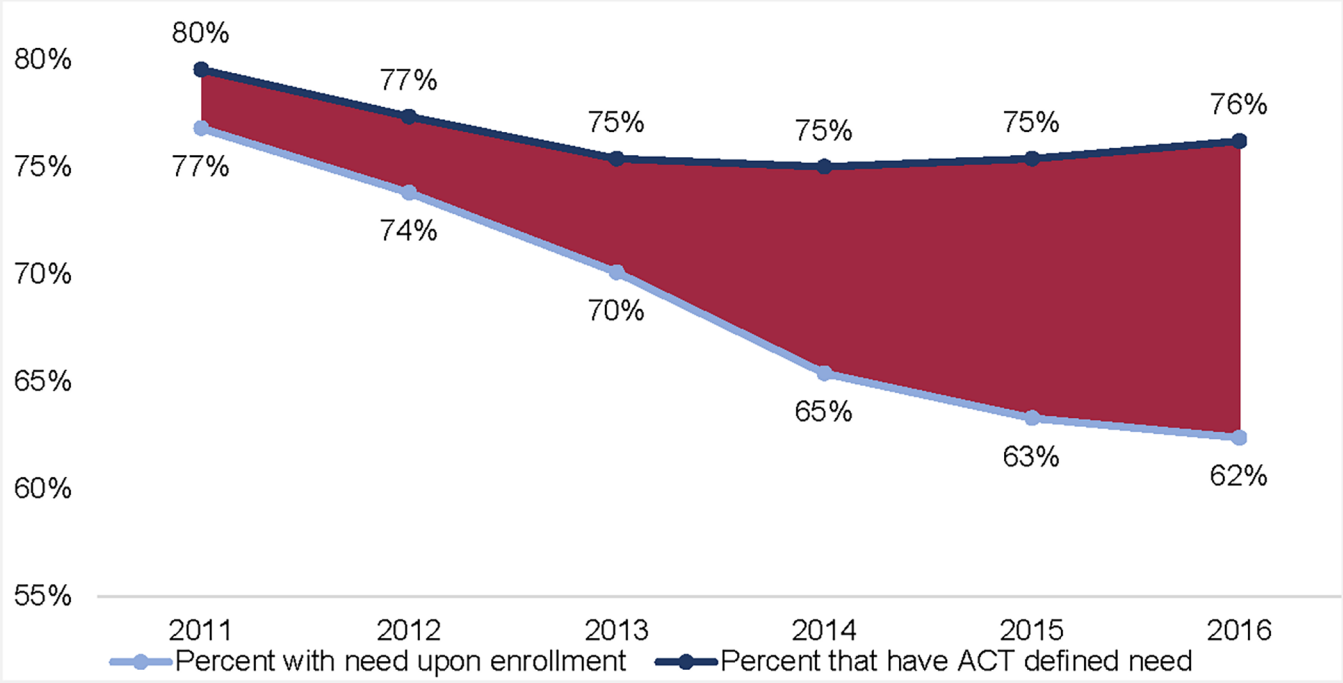
Alternative placement exams – TBR's learning support policy requires all community colleges to allow students "to challenge placement into learning support" by taking an "approved nationally normed standardized assessment." ACCUPLACER, a computer-based, multiple choice test for reading, writing, and math, is the most common alternative assessment used by community colleges and locally governed institutions. Unlike the ACT, these tests are untimed. Institutions set benchmark scores that students must achieve to qualify for a course without learning support. Some institutions also use other alternative assessments for placement or allow students to choose whether to enroll in learning support.

Comparing Learning Support Qualification to Enrollment

Exhibit 9 compares the percentage of students who qualify for learning support based on ACT scores with the percentage of students who require learning support at enrollment. The percentage of students who qualified for learning support based on ACT scores (the dark blue line) has slightly declined since 2010 but remained steady between 2013 and 2016. At the same time, the percentage of students reported by institutions as requiring – and most likely enrolling in learning support (the light blue line) – has declined. According to an official with TBR, the difference between the two numbers (14 percentage points in 2016) is most likely the result of students increasingly taking advantage of SAILS and Summer Bridge programs. Though the percentage of students assigned to learning support has declined, the success rate in entry level college courses for such students remains unclear.

[G] The state's four-year institutions do not have uniform policies on SAILS credit.

Exhibit 9: Percent of first-time freshmen at community colleges whose ACT scores qualified them for learning support, compared to percent who require learning support at enrollment, 2011 – 2016



Measuring Learning Support Success

The more college credit a student earns in the first year of enrollment, the more likely that student is to earn a postsecondary credential.[2] Because of this, gateway courses – a common term used to describe the first credit-bearing, college-level courses in a program of study – are crucial components of student success. Since learning support accompanies gateway courses, gateway course completion rates for students enrolled in learning support are one of the most useful metrics to measure the success of learning supports across different institutions and student demographic groups.

Community Colleges

Tennessee's 13 community colleges use the corequisite model of learning support to provide extra assistance to academically underprepared students. Students who have not demonstrated subject area proficiency are required to enroll in a corequisite course along with the gateway course for subjects in which they are academically underprepared. These students are placed in a three credit hour, college-level gateway course, and simultaneously enrolled in a paired three credit hour corequisite course designed to provide extra instruction toward mastery of the subject matter. Community colleges take different approaches to scheduling students for these courses.[H]

Community colleges in Tennessee have not always offered the corequisite model of learning support. The timeline in Exhibit 10 highlights important policy changes regarding the delivery of learning support in Tennessee's community colleges.

[H] In all cases, students take the paired corequisite course only with other students who require learning support. In some institutions, however, corequisite students are scheduled in gateway courses with non-corequisite students.

Exhibit 10: Policy changes in Tennessee community colleges related to learning support

Prior to 2014: Primarily Prerequisite Remediation Offered

Prior to 2014, community colleges primarily offered prerequisite remediation to academically underprepared students.

2014: Tennessee Board of Regents (TBR) Corequisite Pilot

In 2014, the Tennessee Board of Regents piloted a corequisite model for community college students in response to research about the negative effects of prerequisite remedial courses.

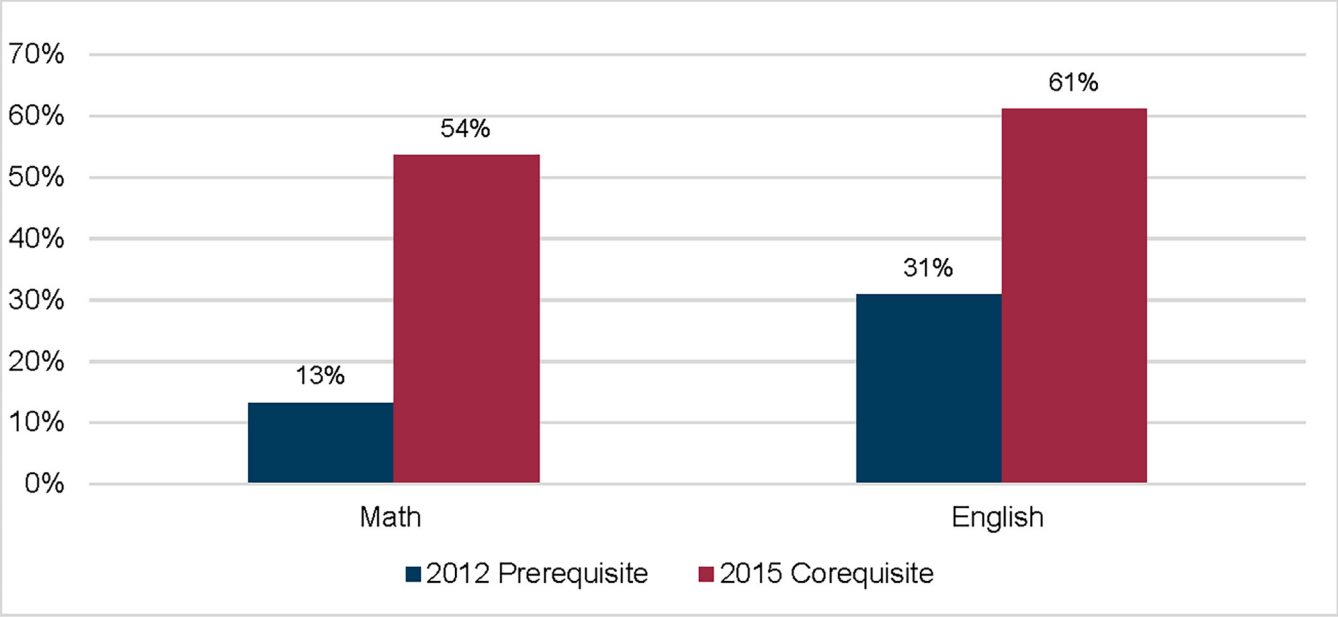
Since 2015: Corequisite Model Implemented

After a successful pilot, corequisite courses replace prerequisite courses at all of the state's 13 community colleges.

TBR implemented a corequisite model in line with research that shows prerequisite remedial coursework – in which a student is required to take and pass a course designed to close skill gaps before being allowed to enroll in a college-level, credit-bearing course – can hurt a student's chances for postsecondary success. In a 2012 joint report, several education organizations, including the Education Commission of the States, found that less than one in 10 students who took traditional prerequisite courses in community college graduated within three years. The same study found that 30 percent of students failed to show up to their first prerequisite course.[3]

In line with prior research, OREA found that Tennessee's shift away from prerequisite remedial coursework has significantly improved outcomes for community college students who are academically underprepared, helping students earn college credit in English and math gateway courses at higher rates than under the prerequisite model.[4] (See Exhibit 11).

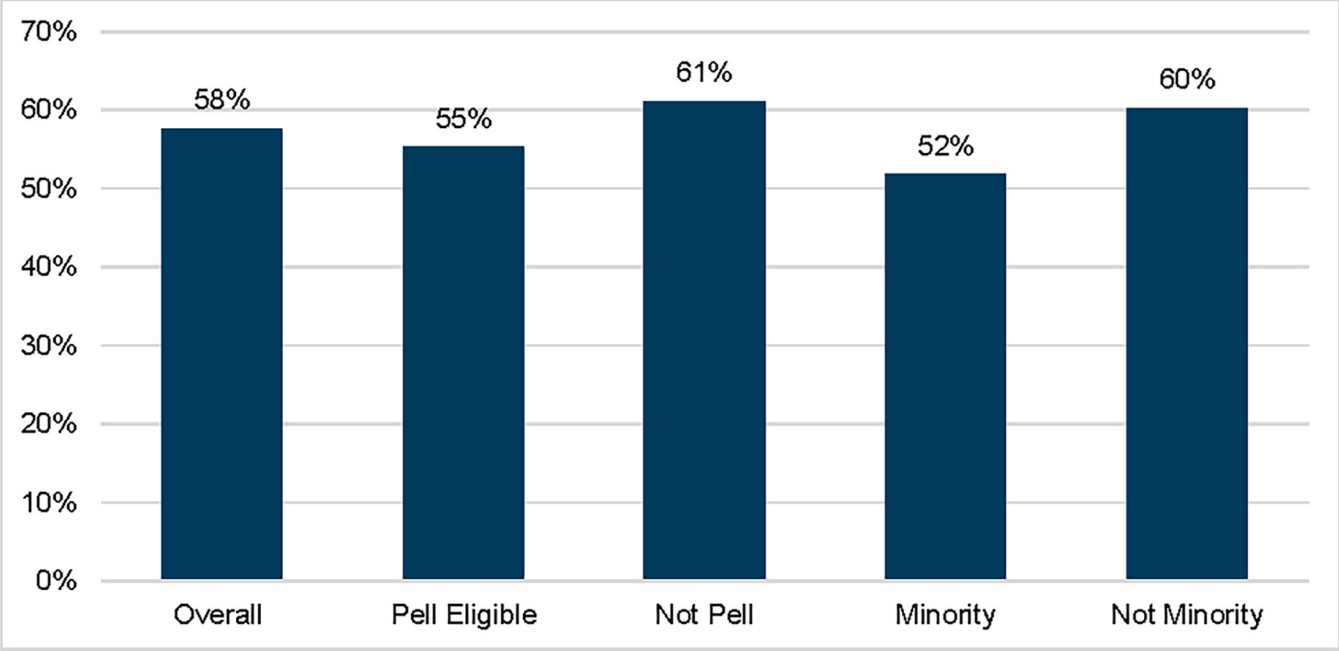
Exhibit 11: Percent of academically underprepared students in community college who completed their gateway course within one year, 2012 prerequisite model and 2015 corequisite model



Note: Dyersburg State had partially implemented the corequisite model in 2015.

Although higher overall under the corequisite model, student success rates vary among community colleges and student demographic groups. As Exhibit 12 demonstrates, Pell-eligible students and minority students enrolled in learning support are less likely overall than their peers to successfully complete corequisite-paired gateway courses.

Exhibit 12: Percent of students in community college completing the corequisite-paired gateway course within one year, by student subgroup, 2015



These gaps in success rates between student subgroups are smaller than gaps in learning support need of first-time freshmen as defined by ACT scores, however. For example, as Exhibit 5 on page 7 demonstrates, there is a 30-percentage point gap in learning support need between minority students and nonminority students, as compared with an eight-percentage point gap in gateway course completion rates under the corequisite model.

A 2016 study of 400 first-time freshmen in Tennessee found the corequisite model cost less per successful student than the older prerequisite model.[5] The cost per successful student was $3,840 under the corequisite model as compared with $7,720 for the prerequisite model. Implementation costs for the corequisite model ($786,000) were higher than for the prerequisite model ($382,000), but students were more successful under the corequisite model. Fifty-one percent of students successfully completed gateway courses under the corequisite model, compared to 12 percent under the prerequisite model. The difference in success rates resulted in a lower cost per successful student for the corequisite model.

Completion Rates Across Institutions

OREA examined gateway course completion rates for all 13 community colleges to better understand differences at the institutional level.[I] In 2015, the most recent year for which OREA was able to acquire community college course completion rate data, the state's community colleges exhibited different gateway course completion rates overall, for individual subjects, and for certain student subgroups. (Dyersburg State is not included in Exhibits 13, 14, and 15 because that institution had not fully implemented the corequisite model by 2015.)

Exhibit 13: Number enrolled and gateway course completion rate, all students, 2015

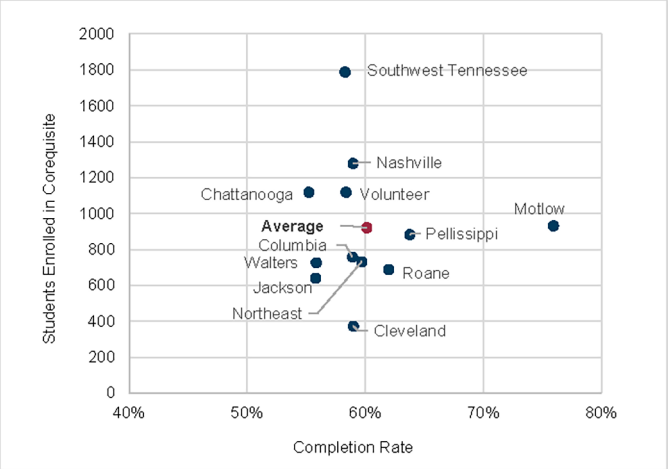
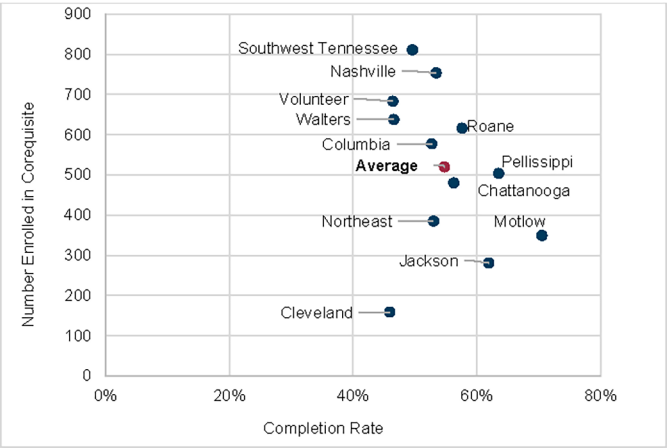


Exhibit 14: English completion overall, 2015



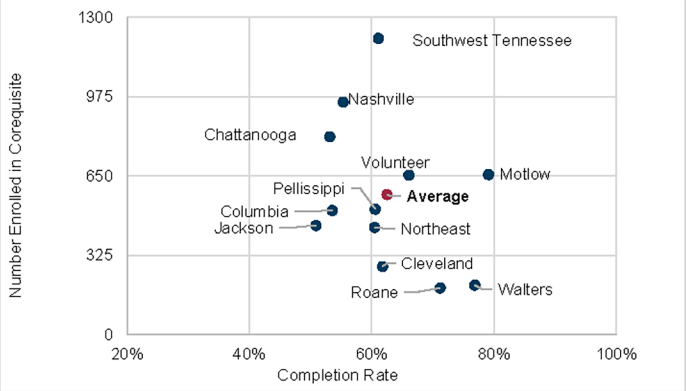
As Exhibit 13 shows, there were differences between institutions in overall gateway course completion rates, regardless of the number of students those institutions enrolled in learning support.[J] Although most institutions exhibited completion rates between 55 and 64 percent, some institutions stand out: Motlow State enrolled an average number of students in learning support and had the highest completion rate, and Southwest Tennessee enrolled the most students in learning support and exhibited completion rates close to the average.

As Exhibits 14 and 15 show, differences in completion rates were more pronounced for individual subjects like math and English,[K] even among institutions that enrolled similar numbers of students in these courses. Motlow State, Volunteer State, and Chattanooga State enrolled between 650 and 900 students in corequisite English courses and exhibited completion rates between 53 and 79 percent. Motlow State had one of the highest completion rates while enrolling a significant number of students in corequisite math courses.

OREA found the largest differences in gateway course completion rates between institutions was for underrepresented minority students. Underrepresented minority students are African American, Hispanic, and Alaskan/American Native students.[L] As Exhibit 16 shows, differences remained after the number of underrepresented minority students served by institutions was taken into account.

[I] Students whose are assigned to learning support are not necessarily required to take learning support during their first semester of postsecondary education. Therefore, gateway course completion rates include all students who qualified for learning support as defined by ACT benchmarks, and enrolled in and completed a course with a corequisite component, not just first-time freshmen.
[J] Differences in completion rates for Pell-eligible students mirror the differences in success rates overall.
[K] OREA examined completion rates for only corequisite English and math courses.
[L] The Tennessee Board of Regents data collection system categorizes these racial/ethnic subgroups of students as "underrepresented minorities."

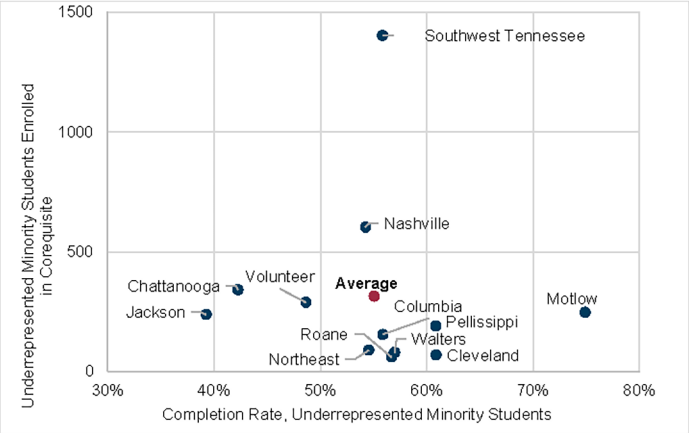
Exhibit 15: Math completion overall, 2015



A number of institutions, such as Motlow State, Columbia State, and Jackson State, all enrolled about the average number of underrepresented minority students in learning support but had gateway course completion rates between 39 percent (Jackson State) and 75 percent (Motlow State). Combined, Southwest Tennessee and Nashville State served 52 percent of all underrepresented minority students enrolled in learning support in the state's community colleges and had completion rates close to or above the average.

In 2015, Motlow State consistently demonstrated the highest or second highest gateway course completion rates, despite enrolling a significant number of students in learning support. Southwest Tennessee consistently outperformed roughly half of all the state's community colleges, despite enrolling the highest number of underrepresented minority students, as well as the highest number of students overall in learning support.

Exhibit 16: Number enrolled and gateway course completion rate, underrepresented minority students, 2015



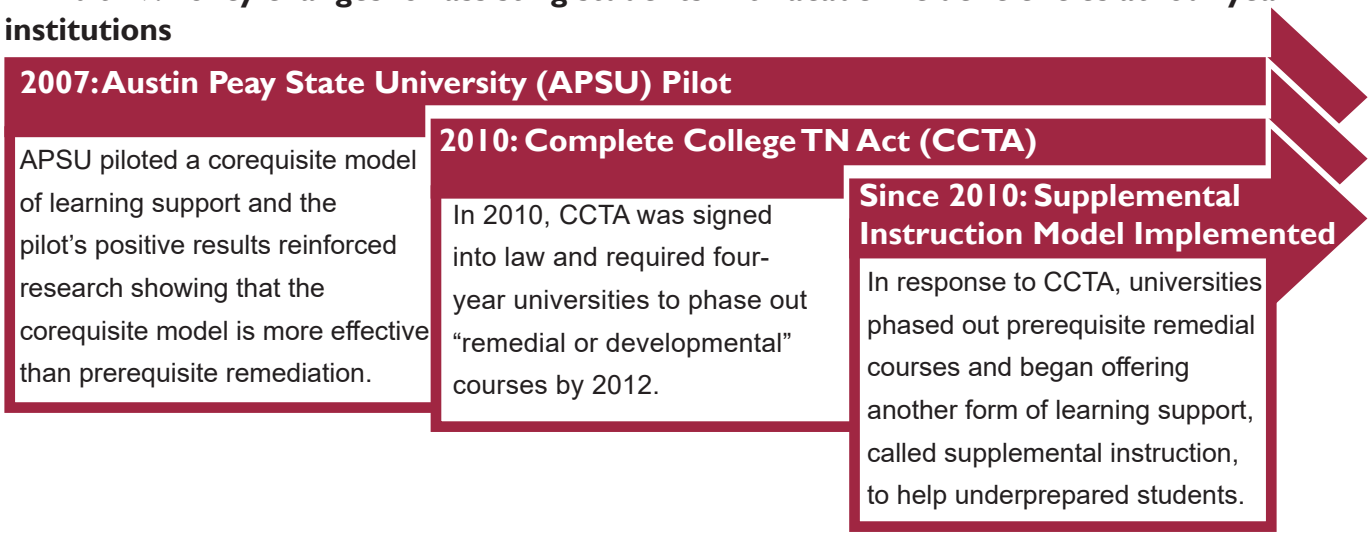
In many cases, institutions that enrolled comparable numbers of similar students in learning support demonstrated different gateway course completion rates. Thus, the gateway course completion rate at individual institutions did not appear to be connected to the number of students enrolled in learning support, suggesting that other institutional or demographic factors play a large role in success rates.

These results highlight the opportunity for institutions to continue to share best practices, ensuring that students who require learning support have the same chance of earning postsecondary credit no matter which community college they attend. TBR's annual corequisite academies provide an opportunity for institutions to collaborate and identify factors that contribute to differences in gateway course completion rates. This type of communication could be especially helpful in the case of institutions that enroll few students in learning support, where completion rates could be improved by targeting support to a relatively small population of students.

Four-Year Institutions

Like the community colleges, the approaches that four-year institutions take to help students with academic deficiencies has changed in recent years, as shown in Exhibit 17.

Exhibit 17: Policy changes for assisting students with academic deficiencies at four-year institutions



In 2007, APSU became one of the first institutions in Tennessee to move away from prerequisite remediation. Other universities followed suit in subsequent years. In 2010, the Complete College Tennessee Act (CCTA) prohibited universities from offering "remedial or developmental courses" as defined by the Tennessee Higher Education Commission.[6] In response to CCTA, universities phased out prerequisite remedial courses and began offering another form of learning support, called supplemental instruction, to help close skill gaps for students with academic deficiencies. Tennessee's six locally governed institutions and University of Tennessee's three main institutions offer supplemental instruction – a form of learning support in which students are assigned to extra help alongside their gateway course – to academically underprepared students, but there is variation in the frequency of its use, the method of content delivery, and the courses with which it is offered.

For English, eight of the nine institutions offer some form of supplemental instruction paired with English Composition, the entry level English course. This takes the form of an extra class meeting each week where students receive more face-to-face time with instructors, or self-paced, computer lab-based work. At one of Tennessee's four-year universities, UT Martin, the entry level English course for students assigned to supplemental instruction lasts for two semesters rather than the more typical single semester seen at other institutions.

In math, however, a student's pathway to and through his or her first credit-bearing math course looks different across universities. (See Appendix A.) Many institutions offer general education math courses paired with supplemental instruction,[M] while other universities have only optional learning supports that are available to all students, not specifically designed for students identified as academically underprepared. Many math departments give students three gateway course options (college algebra, applied math, or statistics), which students choose based on the requirements of their planned major. Other math departments offer students two gateway course options.

UT Chattanooga and UT Martin both have unique approaches for students with skill gaps in math. UT Chattanooga has an agreement with local community colleges that enables students to take corequisite

[M] Not all students who are assigned to learning support enroll in learning support. Students may challenge placement through diagnostic testing, or, at some institutions, opt out of learning support by choice.

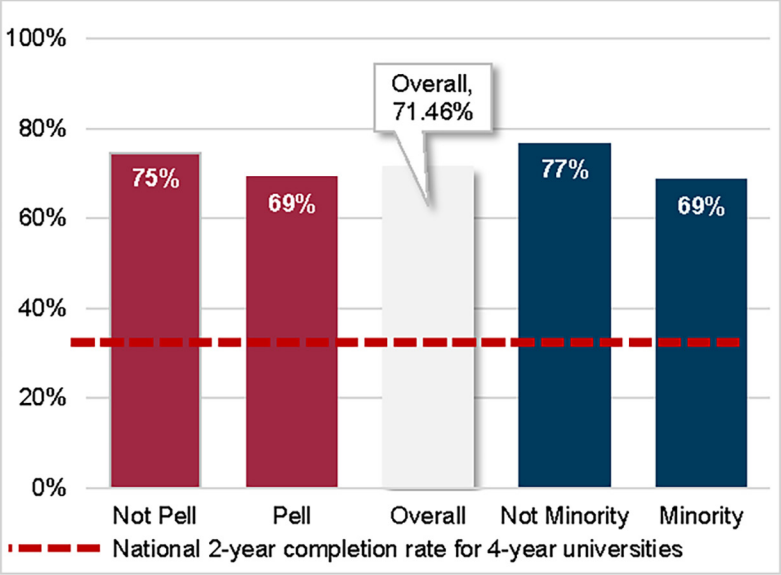
learning support courses at a community college. Like the approach taken for English, the entry level college algebra course for students assigned to supplemental instruction at UT Martin lasts for two semesters rather than the more typical single semester at other institutions.

Student Success: Locally Governed Institutions

Under the supplemental instruction model, students at the locally governed institutions have passed gateway courses at high rates. As exhibit 18 demonstrates, in the 2015-16 school year, over 70 percent of students enrolled in supplemental instruction passed a gateway course in the first semester, compared to the 36 percent national two-year average for 2014. (See Exhibit 18) In other words, in a fourth of the time (one semester versus two years), students at Tennessee's locally governed institutions passed their first gateway courses at higher rates than the national average rate, suggesting that the move away from prerequisite remediation has been an effective shift for students with academic deficiencies.

OREA's analysis shows that achievement gaps exist for gateway course completion rates based on socioeconomic status and race, but these gaps are smaller than gaps in qualification for learning support based on ACT scores. For example, in 2016, there was a 28 percentage point gap between underrepresented minority students who qualified for learning support based on ACT scores and their peers. (See Exhibit 5 on page 7.) However, the percentage of underrepresented minority students who passed gateway courses was within 10 percentage points of their peers who passed such courses. (See Exhibit 18.)

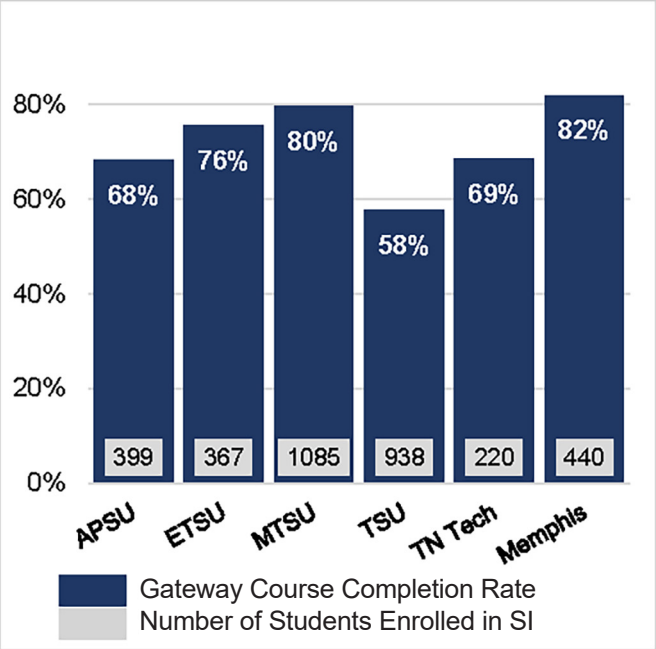
Exhibit 18: Success rates of supplemental instruction students in gateway courses, by subgroup, 2015



Note: 23 TSU students are missing from this data due to missing demographic information. This accounts for .08 percent of the total data and would not affect completion rates significantly.
Sources: The national average is from Complete College America's report *Corequisite Remediation: Spanning the Completion Divide.*

Student success rates also varied by locally governed institution, each of which serve different student bodies with varying needs. High numbers of students enrolled in supplemental instruction did not appear to be consistently associated with low rates of success or vice versa. Middle Tennessee State University (MTSU) and Tennessee State University (TSU) had the highest number of students enrolled in supplemental instruction but different completion rates, as shown in Exhibit 19. MTSU served the highest number of students in supplemental instruction and had the second highest completion rate. TSU served slightly fewer students than MTSU and had the lowest success rate. The University of Memphis served more students than APSU, Tennessee Technological University (TN Tech), and East Tennessee State University (ETSU), and had the highest overall success rate.

Exhibit 19: Number and completion rates of students enrolled in supplemental instruction for each of the locally governed institutions, 2015 – 2016



Like the total number of students enrolled in supplemental instruction, the numbers of underrepresented minority and Pell-eligible students were higher at TSU and MTSU, with Memphis following behind those institutions. (See Exhibit 20.)

Institutions with higher numbers of underrepresented minority or Pell-eligible students did not consistently have higher or lower success rates. It is important to note, however, that TSU serves the largest percentage of underrepresented minority and Pell-eligible students, which may contribute to its lower completion rates. (See also Exhibit 5 on page 7, which shows a higher percentage of underrepresented minority and Pell-eligible students qualifying for learning supports compared to their peers.)

Exhibit 20: Number of students enrolled in supplemental instruction by student subgroups, 2015 – 2016

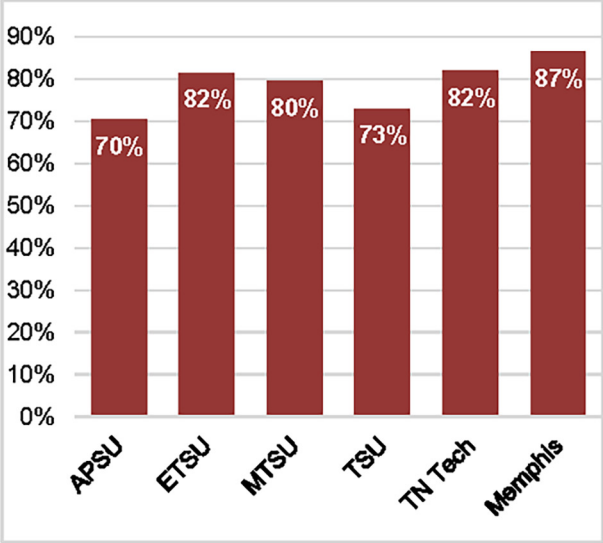
	TSU	MTSU	Memphis	APSU	ETSU	TN Tech
Number of Underrepresented Minority Students	831	635	305	165	85	50
Number of Pell-eligible Students	670	716	N/A	246	187	111

Note: Memphis did not report Pell-eligibility data in 2015 – 2016.

Student Success in English

As mentioned above, there are differences in how the locally governed institutions help students through their first gateway courses. The differences in approach for supplemental instruction in English were minor and all institutions had a success rate of 70 percent or higher. (See Exhibit 21.) The University of Memphis, which had the highest completion rate for the 2015-16 school year, evaluated the institution's supplemental instruction practices and made changes based on the results. For example, Memphis tried using a lab-based supplemental instruction model, but according to one staff member at the institution's academic counseling center, it did not work well for them, and they adjusted practices accordingly.[7]

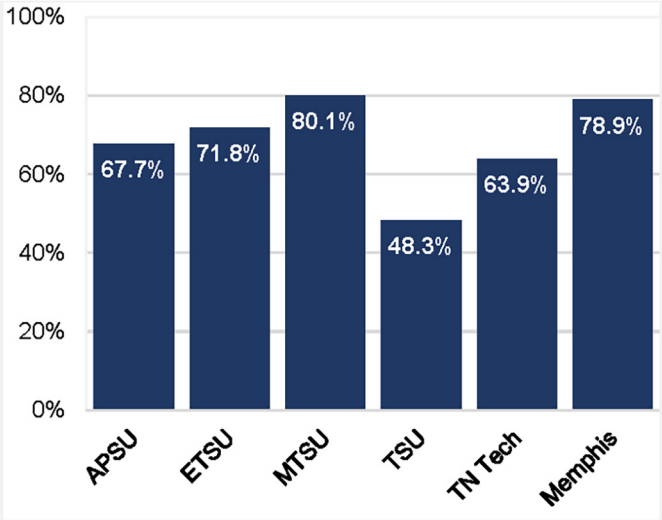
Exhibit 21: Gateway course completion in English by institution, 2015 – 2016



Student Success in Math

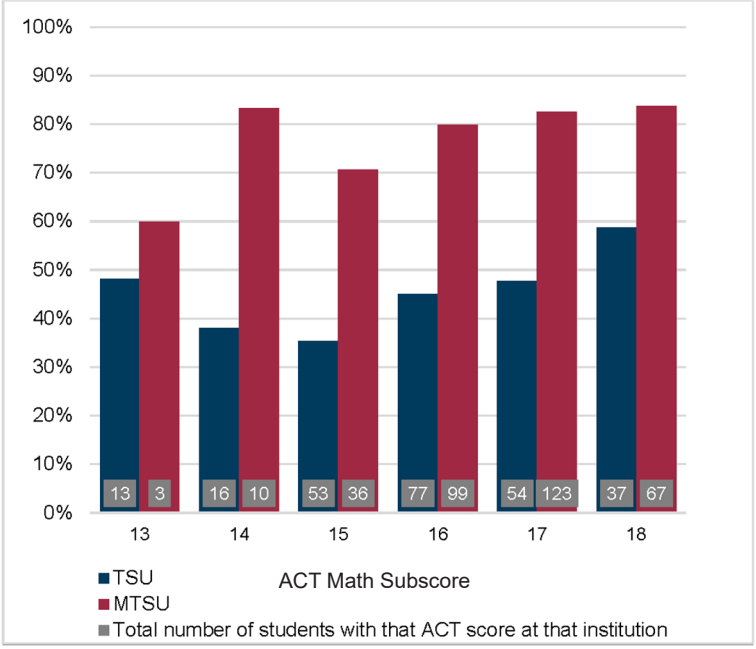
In math, student success in supplemental instruction courses differs more widely (Exhibit 22) than for English, as do the course offerings and method of supplemental instruction. OREA performed an in-depth comparison (Exhibit 23) between TSU, the institution with the lowest math completion rate, and MTSU, the institution with the highest completion rates. When comparing only Pell-eligible, underrepresented minority students, MTSU still had a higher completion rate, regardless of student ACT score, suggesting that institutional practices, including supplemental instruction methods and course offerings, are contributing factors to the differing completion rates across institutions.

Exhibit 22: Completion rate for supplemental instruction math gateway courses by institution, 2015 – 2016



Approaches among institutions differ by course offerings and pairings. All of the locally governed institutions, other than TSU, offered statistics as a gateway course. Recent studies show that students whose ACT score indicated academic under-preparedness do better in statistics than in courses focused on algebraic skills.[8]

Exhibit 23: Success rate of Pell-eligible minority students in supplemental instruction paired gateway course by ACT score, 2015 – 2016



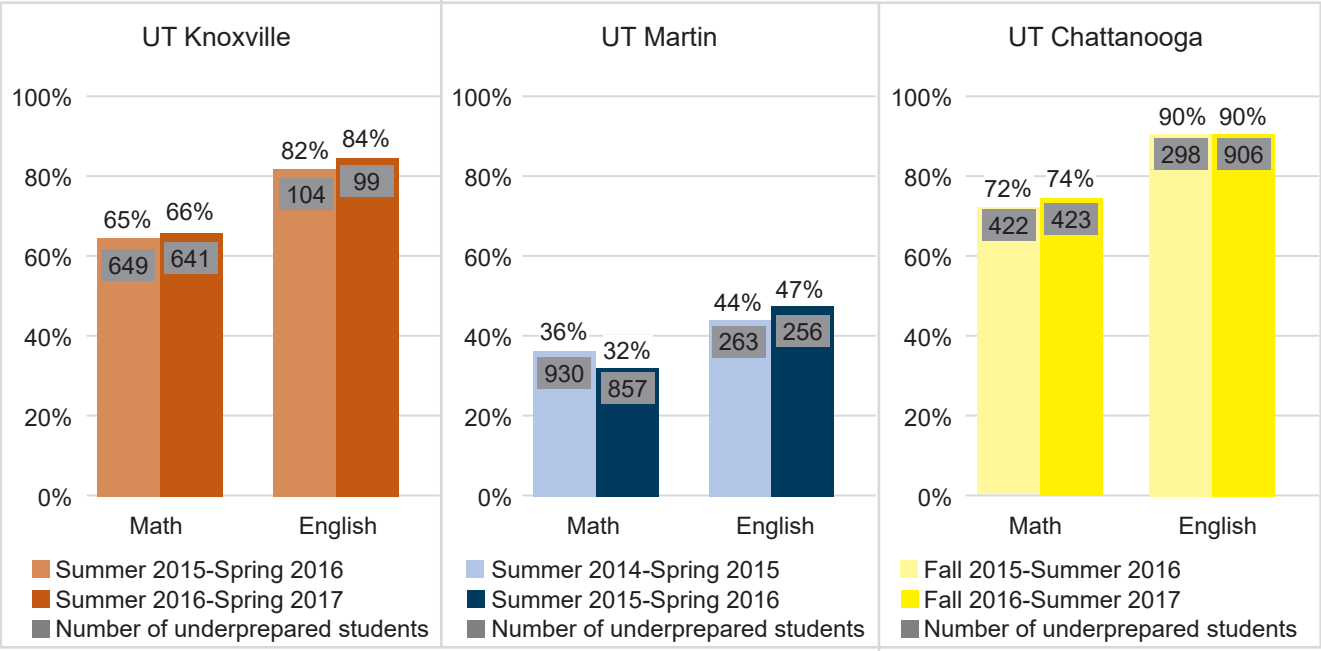
Another example of an approach that could have a positive effect on completion rates is MTSU's practice of student mentoring.[9] Under student mentoring, another student provides the supplemental instruction that is paired with a gateway course. Research has found student mentoring is associated with success in entry level college courses, and an official at TBR identified student mentoring as a possible contributing factor to MTSU's high completion rate.[10]

Student Success: University of Tennessee Institutions

UT Knoxville, UT Chattanooga, and UT Martin take different approaches to learning support and show varying levels of student success.

Students who qualify for learning support at UT Knoxville and UT Chattanooga have English and math completion rates above the average for Tennessee public universities.[N] Completion rates for both subjects at UT Martin are below the average.

Exhibit 24: Number of students who qualify for learning support based on ACT scores and gateway course completion rates, University of Tennessee



Like the approach taken by the locally governed institutions, students who qualify for learning support in English at UT Knoxville and UT Chattanooga are enrolled in a single semester, entry level English course paired with supplemental instruction. The entry level English course for students assigned to supplemental instruction at UT Martin lasts for two semesters rather than the more typical length of a single semester as seen at other institutions. A lengthier timeframe for completing gateway courses is associated with lower completion rates according to research.

In math, none of the three UT universities use supplemental instruction paired with gateway courses; instead, all three offer voluntary math tutoring. UT Knoxville and UT Chattanooga give students three gateway course options (college algebra,[O] applied math, and statistics) and students can choose the gateway math course that satisfies the requirements for their prospective majors. UT Martin gives students two gateway course options (college algebra and applied math) and does not offer statistics as an option. Emerging research suggests students who are academically underprepared in math perform

[N] The 2015 average gateway course completion rate for Tennessee universities in English was 78 percent and for math was 65 percent.
[O] UT Chattanooga students can take college algebra at Cleveland State or Chattanooga State if they qualify for learning support based on ACT score.

better in statistics than in college algebra.[11] With the exception of TSU and UT Martin, all public four-year institutions in Tennessee offer statistics as a gateway course in math.

Like the approach taken for English, the entry level college algebra course for students assigned to supplemental instruction at UT Martin lasts for two semesters rather than the more typical length of a single semester as seen at other institutions. This two-semester college algebra course is also a prerequisite for statistics. At UT Martin, a student whose ACT indicates a need for learning support must take two semesters of college algebra before beginning statistics. As stated previously, a lengthier timeframe for completing gateway courses is associated with lower completion rates according to research.

Conclusion

Public higher education institutions across Tennessee offer students who have subject-area deficiencies extra academic assistance – called learning support – designed to ensure their success in entry level college courses. The more college credit a student earns in the first year of enrollment, the more likely that student is to earn a postsecondary credential. Thus, succeeding with learning support is linked to increasing the number of Tennesseans with a postsecondary credential.

Tennessee institutions have implemented new methods of learning support to improve student success rates. Although high overall, success rates for students enrolled in learning support vary by higher education institution, course, subject, and student type. (See Exhibits 13-16, 19-22, and 24.) OREA's analysis identified institutions with higher success rates of students completing gateway courses, but higher education institutions in Tennessee serve different populations and what works at one place may or may not work at another. Institutions, though, can use demographic information to find peer institutions and communicate with each other about what works best for institutions with similar populations. Further analysis of the factors leading to higher success rates and sharing of best practices would continue to help improve student success rates.

See Appendices A-C for information about institution-level math pathways and success rates by course for the six locally governed institutions.

Endnotes

[1] Eric P. Bettinger, Brent J. Evans, and Devin G. Pope, *Improving College Performance and Retention the Easy Way: Unpacking the ACT Exam*, Working Paper 17119, National Bureau of Economic Research, June 2011, http://www.nber.org/papers/w17119.pdf (accessed Jan. 26, 2018).

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[2] Dian Schaffhauser, "First-Year College Credits and Strong GPA Big Predictor of CC Student Success," *Campus Technology*, Sept. 20, 2017, https://campustechnology.com/articles/2017/09/20/first-year-college-credits-and-strong-gpa-big-predictor-of-cc-student-success.aspx (accessed Nov. 27, 2017).

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[3] Charles A. Dana Center, Complete College America, Inc., Education Commission of the States, and Jobs for the Future, *Core Principles for Transforming Remedial Education: A Joint Statement*, Dec. 2012, https://jfforg-prod-prime.s3.amazonaws.com/media/documents/RemediationJointStatement-121312update.pdf (accessed March 9, 2017).

[4] S.S. Jaggars, N. Edgecombe, and G.W. Stacey, *What we know about accelerated developmental education*, Community College Research Center, Teachers College, Columbia University, https://ccrc.tc.columbia.edu/publications/what-we-know-accelerated-developmental-education.html (accessed Dec. 28, 2017).

Complete College America, "Corequisite Remediation: Spanning the Completion Divide," http://completecollege.org/spanningthedivide/ (accessed Dec. 28, 2017).

[5] Clive Belfield, Davis Jenkins, and Hana Lahr, *Is Corequisite Remediation Cost-Effective? Early Findings From Tennessee*, Teacher's College Columbia University: Community College Research Center, April 2016, https://ccrc.tc.columbia.edu/media/k2/attachments/corequisite-remediation-cost-effective-tennessee.pdf (accessed Sept. 11, 2018).

[6] 106th Tennessee General Assembly, First Extraodinary Session, Public Chapter 3, 2010, Complete College Tennessee Act of 2010, https://publications.tnsosfiles.com/acts/106/pub/pc0003EOS.pdf (accessed July 26, 2018).

[7] University of Memphis, Academic Counseling Center, telephone interview, Sept. 27, 2017.

[8] A. W. Logue, Mari Watanabe-Rose, and Daniel Douglas, "Should Students Assessed as Needing Remedial Mathematics Take College-Level Quantitative Courses Instead? A Randomized Controlled Trial," *Educational Evaluation and Policy Analysis*, Vol. 38, 2016, pp. 578-598, https://doi.org/10.3102/0162373716649056 (accessed July 26, 2018).

Education Commission of the States, *Blueprint for College Readiness, A 50-State Policy Analysis*, http://www.ecs.org/docs/ECSBlueprint.pdf (accessed Feb. 6, 2017).

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[9] Tennessee Board of Regents, interview, Nov. 15, 2017.

[10] Logue, Watanabe-Rose, and Douglas, "Should Students Assessed as Needing Remedial Mathematics Take College-Level Quantitative Courses Instead? A Randomized Controlled Trial."

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[11] Logue, Watanabe-Rose, and Douglas, "Should Students Assessed as Needing Remedial Mathematics Take College-Level Quantitative Courses Instead? A Randomized Controlled Trial."

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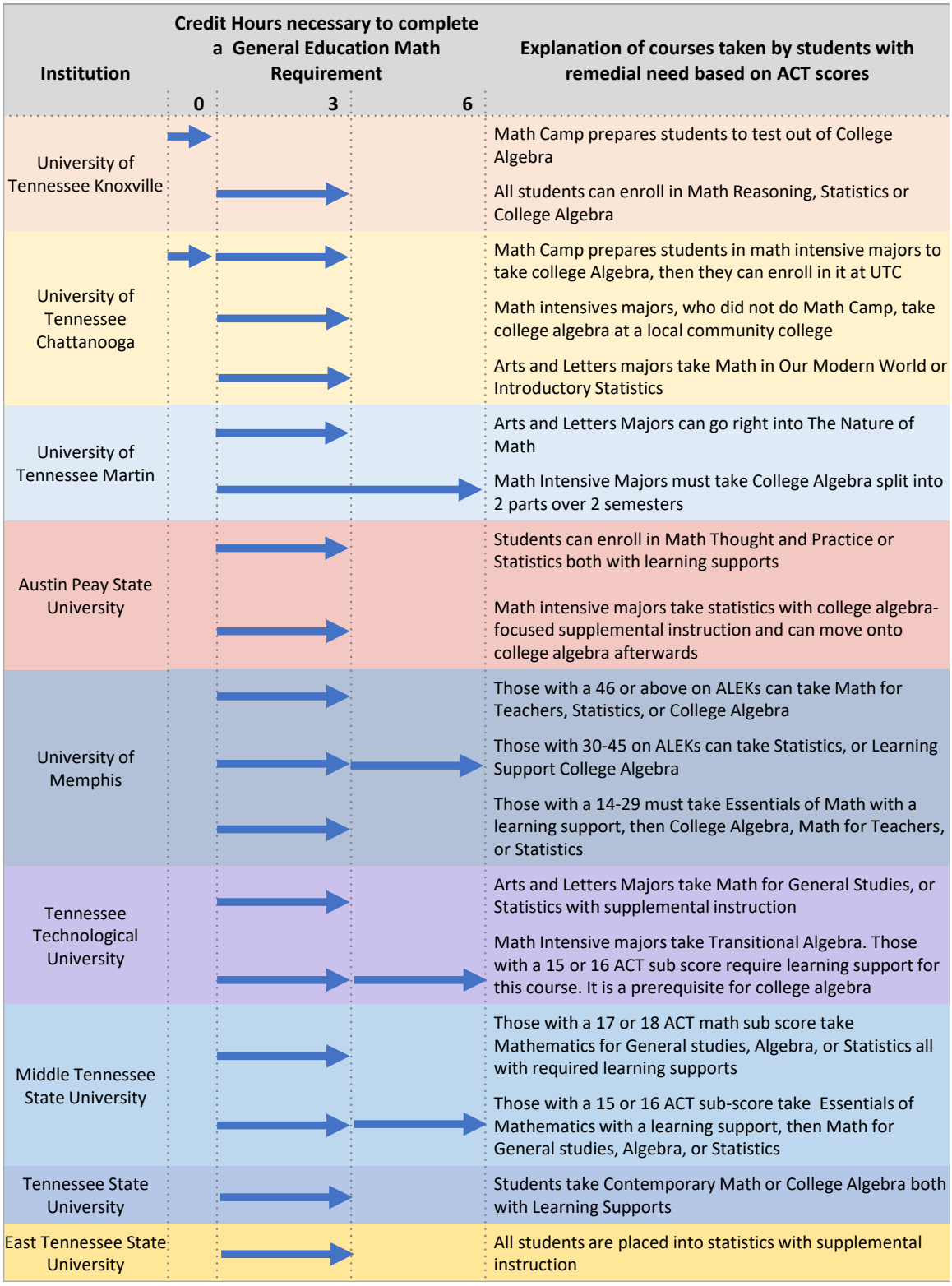
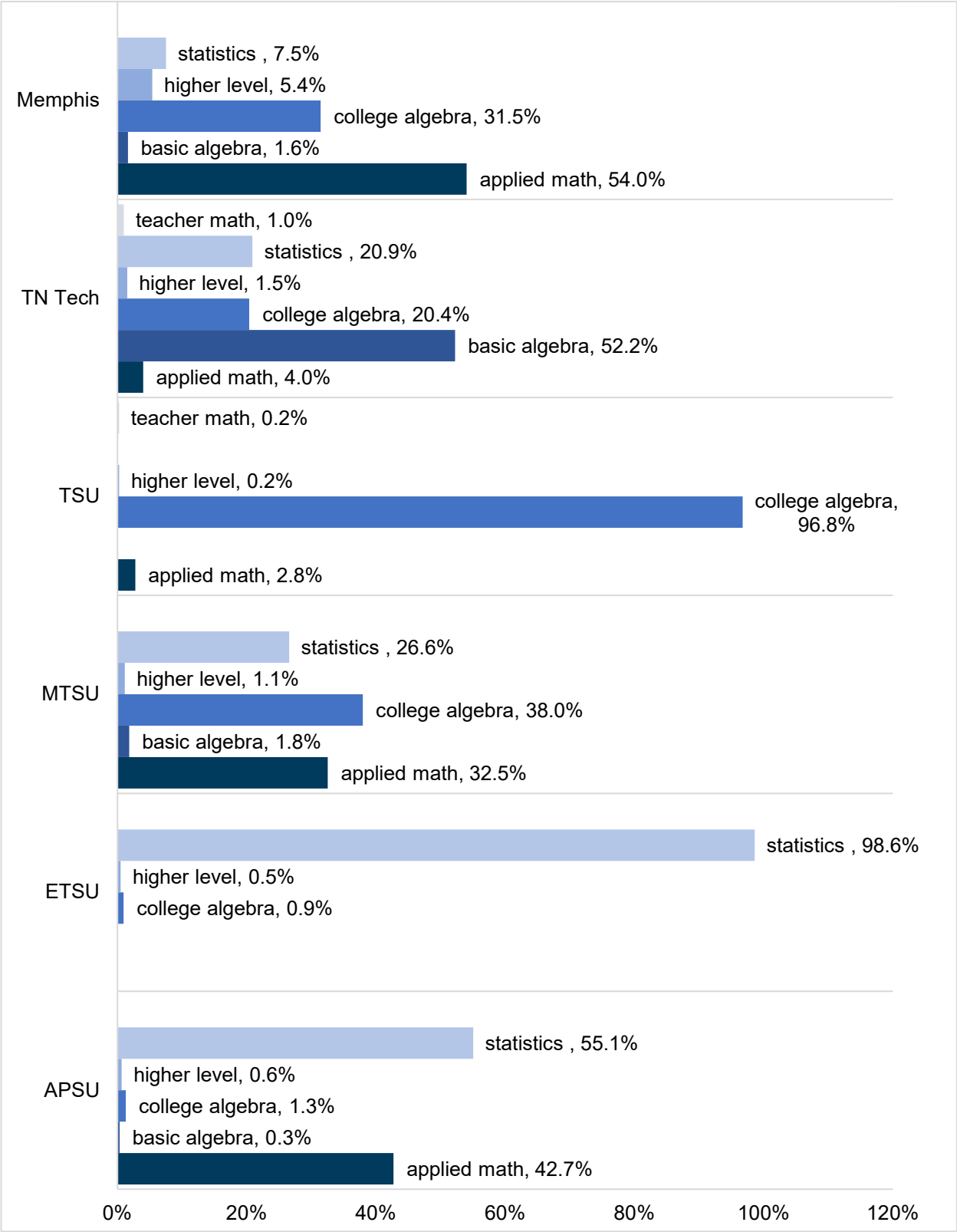
Appendix A: Math pathways and success rates by course and locally governed institution[A], 2017

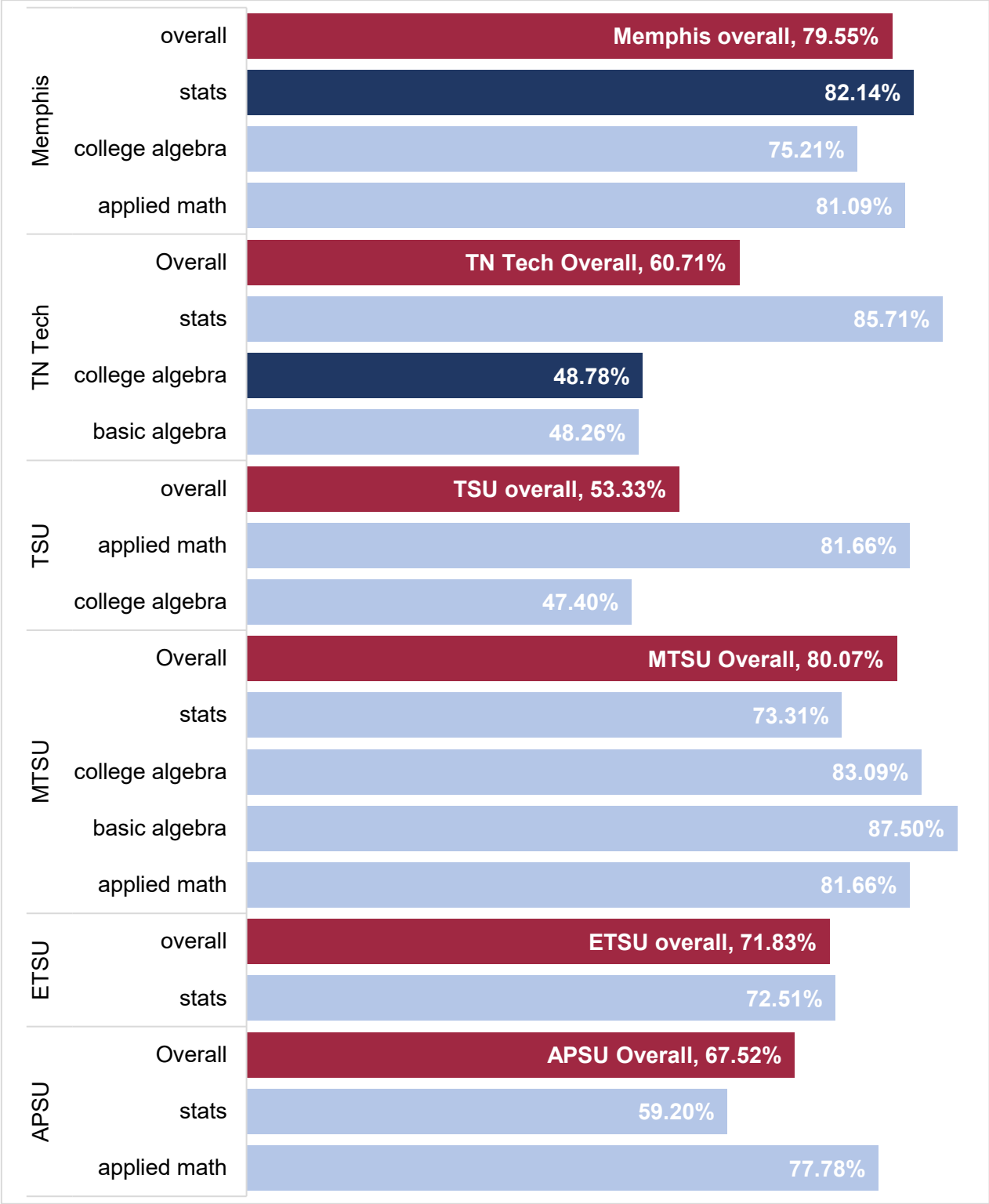


[A] None of the UT schools offer supplemental instruction. See the Student Success: University of Tennessee (UT) section of this report for more information.

Appendix B: Classes in which students who qualify for learning support based on ACT score enroll in the first semester, by locally governed institution, 2015 – 2016



Appendix C: Course level completion rates for students with ACT scores qualifying them for learning support (Dark blue bars are courses offered without supplemental instruction), 2015 – 2016



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