

BACKGROUND

TBR’s open-access institutions welcome students at all levels of academic preparedness across the state, and financial aid programs like TN Promise and TN Reconnect have made it possible for thousands of students to attend free of tuition and mandatory fees. Many of these students enroll in programs that lead to jobs in high-demand and STEM (Science, Technology, Engineering, and Mathematics) occupations in Tennessee. High-Demand programs are programs that might lead to one of the 259 high-demand jobs in Tennessee, according to the [LEAP 2018 Occupational Analysis](#). This occupational analysis is produced each year by the Center for Economic Research in Tennessee, which is part of the TN Department of Economic and Community Development.

In the LEAP 2018 Occupational Analysis, 35 of the 259 high-demand occupations in Tennessee are in STEM fields. Jobs in these 259 occupations are expected to grow 12%, while the 35 jobs in STEM fields are expected to grow 18% from 2017-2020. This means that these STEM fields are among the fastest growing occupations in Tennessee. Over half of all jobs are considered “middle-skill”, meaning jobs that require education beyond high school but not a four-year degree, but economists predict the supply of workers to fill these jobs will fall millions short of employer demand (National Skills Coalition, 2015; Carnevale, Smith, & Strohl, 2013).

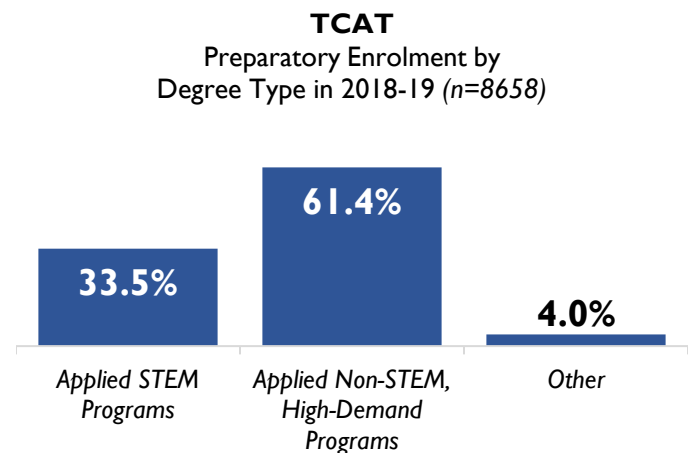
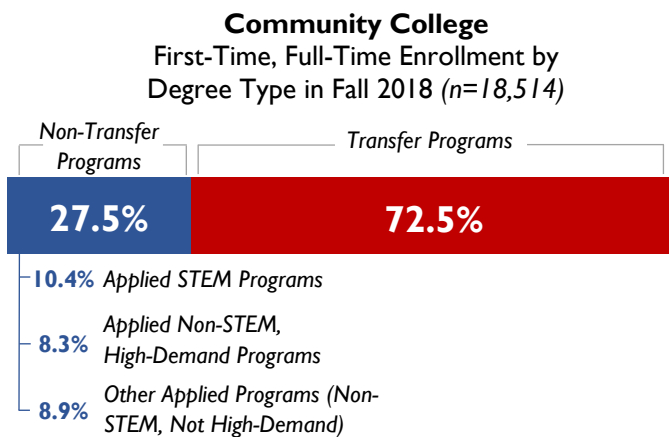
This summary explores TBR’s involvement in training Tennesseans for high-demand and STEM occupations, with the goal of strengthening the pipeline from Tennessee high schools to high-demand and STEM occupations in Tennessee. While TBR serves thousands of students each year, we hope to enhance our colleges’ partnerships with both the local education agencies in their areas and with employers and the workforce by identifying trajectories that position individuals to complete credentials in fields that align with their prior academic performance and high-demand job opportunities.

COMMUNITY COLLEGE ENROLLMENT

In fall 2018, there were 18,514 first-time, full-time (FTFT) freshmen at TBR community colleges. Of these students, 7 out of 10 enrolled in a program designed to transfer to a four-year university¹. Additionally, **1 in 10 enrolled in an applied STEM program**, and 8.3% enrolled in programs that were not STEM, but are in high-demand in Tennessee. The other 8.9% were enrolled in a program that was neither considered STEM nor high-demand.

TCAT ENROLLMENT

At the Tennessee Colleges of Applied Technology (TCATs) in fall 2018 and spring 2019, **1 in 3 preparatory TCAT students enrolled in a STEM program**, and almost all of the remaining students enrolled in programs that were not STEM but are in high-demand in Tennessee. Only 4% of TCAT preparatory students enrolled in a program that was neither STEM nor high-demand, according to the LEAP definitions.



RESEARCH QUESTIONS

Using TBR’s student information system and other data resources, we hope to answer some key questions:

- Which TBR programs lead to high-demand jobs with a living wage? What are their employment outcomes?
- How does enrollment in college program vary by geography and student characteristics?
- In what ways do middle and high-school course-taking patterns, including participation in EPSOs, impact persistence and success?
- What are the barriers to persistence for students who expressed interest or showed aptitude in STEM in late middle or early high school, but did not pursue a STEM program at a postsecondary institution?

This summary provides an initial look at key data points that will inform future research.

¹ Programs designed to transfer to a university include the Associate of Arts, Associate of Science, Associate of Science in Teaching, and Associate of Fine Arts. This is inclusive of University Parallel programs and the Tennessee Transfer Pathways (TTPs).

INITIAL OBSERVATIONS

1 Most STEM and High-Demand Programs at TBR are in applied fields.

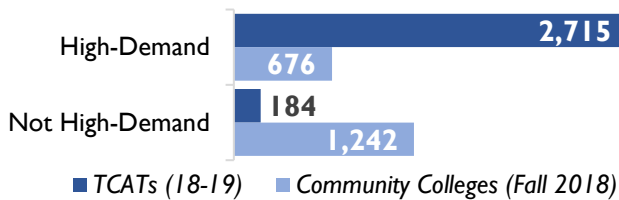
STEM Programs: At TBR community colleges and TCATs, program clusters that could lead to occupations in a STEM field include **Information Technology, Engineering Technology, and Health and Related Clinical Services.**

High-Demand Programs: Some STEM programs are high-demand, but in addition, the non-STEM high-demand TCAT program clusters include **Mechanic and Repair Technologies, Precision Production, Personal and Culinary Services, and Business.** At community colleges, these high-demand programs are largely Business and Management programs.

2 Not all STEM Programs at Community Colleges and TCATs are in High-Demand.

While there is some overlap in programs that lead to STEM and high-demand jobs, not all STEM programs are in high-demand in Tennessee. **At community colleges, about one-third of all enrollments in STEM are considered high-demand, and at TCATs, more than 90% of all STEM enrollments are also considered high-demand.**

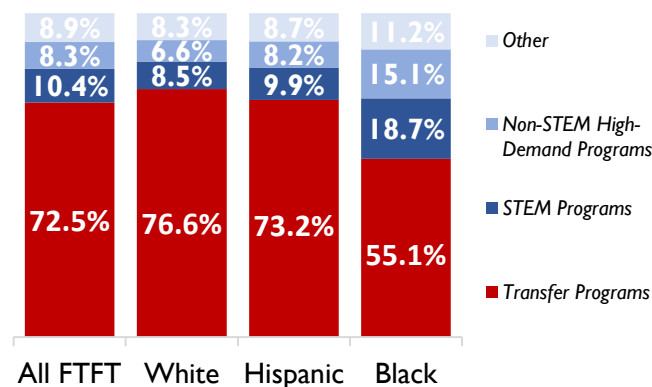
STEM Enrollment at CC & TCATs



3 Program enrollment differs by student characteristics.

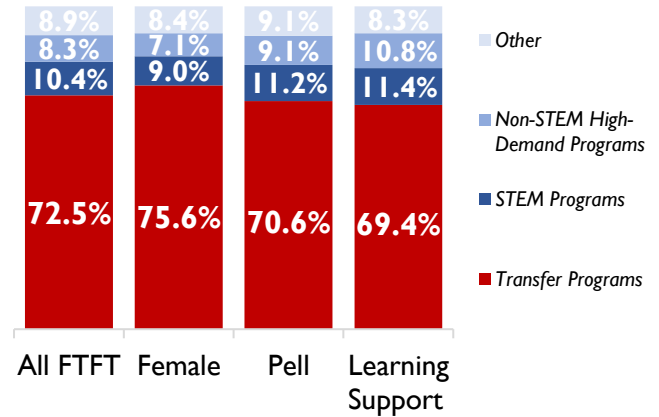
Race/Ethnicity: At community colleges in Fall 2018, over three-fourths of White students and nearly three-fourths of Hispanic students enrolled in programs designed for transfer to a four-year university. Only 55.1% of Black students enrolled in a transfer program, which means that 44.9% of all Black students who were FTFT in Fall 2018 enrolled in applied technical programs.

CC FTFT Enrollment in Fall 2018



Gender, Pell Status, and Learning Support: Of this same first-time, full-time cohort, females were less likely to enroll in STEM and high-demand programs. Pell Grant recipients, as well as students who needed learning support were more likely than the overall FTFT cohort to enroll in the applied STEM and high-demand programs.

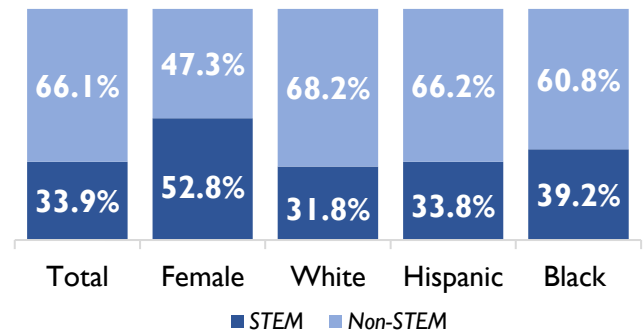
CC FTFT Enrollment in Fall 2018



At TBR community colleges, nearly all women in STEM programs are in health-related programs, while most males in STEM programs are either in IT or Engineering programs.

TCATs: In 2018-19 92.4% of students enrolled in a program that could lead to a high-demand occupation. These high-demand programs were in both STEM and non-STEM fields.

TCAT Enrollment 2018-19



Overall, about one-third of TCAT students enrolled in a STEM program, while the other two-thirds enrolled in a non-STEM program. Female students enrolled in STEM programs at higher rates, though, as just over half of all female students enrolled in a STEM program.

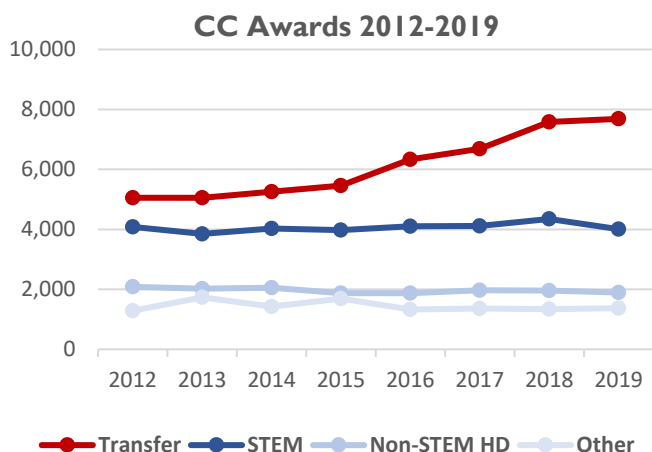
4 Enrollment trends by program type vary significantly across TBR colleges.

Trends in program enrollment vary significantly across institutions. For example, 91.3% of Motlow's first-time, full-time students enroll in degree programs designed for transfer, while only 31.3% of Southwest's students do. At Dyersburg and Northeast, students enrolled in STEM programs outnumber enrollment in any other applied program (not including transfer programs), but at the other 11 colleges, the number of students in non-STEM related degree programs outnumber STEM students.

5 Awards in transfer programs have increased over time, while those in STEM fields have decreased slightly.

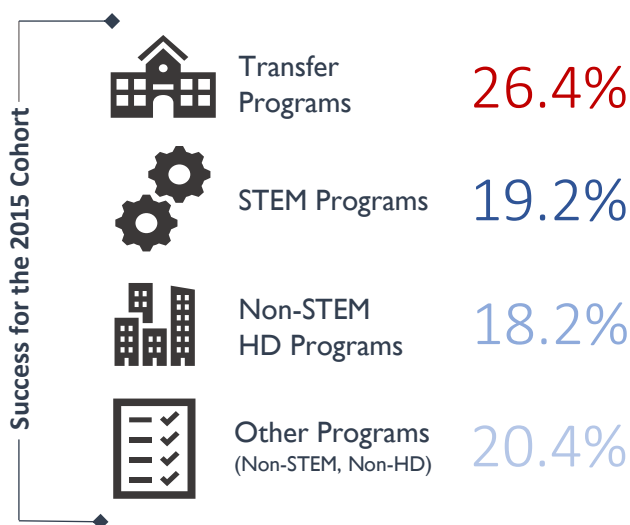
The number of awards granted each year at TBR community colleges has more than doubled over the last 10 years. Transfer programs have seen the most consistent increase in number and share of degree production since 2012.

In 2019, 26.8% of all degrees awarded were in STEM fields, compared to 32.7% in 2012. Non-STEM, High-Demand degree production has remained relatively flat over time, but has become a smaller share of the overall degrees granted since transfer degree production continues to rise.



6 Graduation rates for STEM and high-demand fields are below the cohort average of 23.6%.

The overall graduation rate for the 2015 cohort was 23.6%. Students who enrolled in transfer programs had a graduation rate of 26.4%, which means they graduated at higher rates after three years than those who did not enroll in a transfer program. Students who enrolled in STEM programs, non-STEM high-demand programs, and other programs graduated at a rate lower than the average for the 2015 cohort.



7 Some students enroll in Tennessee Transfer Pathways (TTPs) in STEM and high-demand fields, though more data is needed to fully explore this area.

Because of data limitations, it is harder to classify transfer programs as high-demand and STEM. At nine of the thirteen community colleges, we have some information about which Tennessee Transfer Pathway (TTP) students are enrolled in. Some of the most popular STEM TTPs include Psychology, Biology, Computer Science, and Mechanical Engineering. Non-STEM, high-demand TTP majors largely include Business Majors, Accounting, and Social Work. Non-STEM, non-high demand programs include some health services, criminal justice, and general liberal arts majors.

Nashville State: In Fall 2018, Nashville State had the greatest percentage of students enrolled in a transfer program who were also enrolled in a TTP. In total, 65.2% of first-time, full-time students at Nashville State enrolled in a transfer program. Of these 900 students who enrolled in a transfer program, just over 630 students, or 70.9%, enrolled in a Tennessee Transfer Pathway. Just over 260 students, or 41.2% of those who enrolled in a TTP, enrolled in a STEM TTP. 180, or 28.3% of those who enrolled in a TTP at Nashville state, enrolled in a non-STEM, high-demand TTP. Another 30%, or 191 students, enrolled in a TTP that was neither STEM nor High Demand.

Columbia State: In Fall 2018, Columbia state had 810 students enrolled in a TTP, which was the highest number of TTP enrollments of any TBR Community College. Of these TTP students, 45.9% enrolled in a STEM program, 33.3% enrolled in a non-STEM, high-demand program, and 20.7% enrolled in programs that were non-STEM and non-high demand.

Chattanooga State: At Chattanooga State in Fall 2018, 46% of FTFT students who enrolled in a TTP were in STEM programs. More than half of women in these STEM-transfer programs were studying biological sciences, psychology, or healthcare; half of males studied computer/IT and engineering. The same general trend is also true at Columbia and Nashville State, where women are pursuing IT and Engineering at much lower rates than men.