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Dual Enrollment Matriculation Rates at Tennessee Board of Regents Community Colleges

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ABSTRACT

Dual Enrollment Matriculation Rates at Tennessee Board of Regents Community Colleges

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The purpose of this descriptive, quantitative study is to explore the matriculation rates for first-time, full-time freshmen who were previously enrolled in dual enrollment courses while in high school at one of the 13 public community colleges in Tennessee. Percentages, means, standard deviations, ranges, percentages, and proportions were used to describe the data from the 13 public community colleges in Tennessee. The total number of dual enrollment students from 2016 to 2021 across the 13 community colleges over the five-year period was 80,051. Of the 80,051 students, 16,727 students matriculated to their home institution and 63,324 did not. Findings from the study revealed that the total matriculation of the 13 community colleges over the period totaled a mean percentage of 20.90% or a ratio equating to nearly 1:4. Other variables such as matriculations by gender, race, earned credits, GPA, and ACT scores were studied to better understand matriculation rates by demographic variables.

Findings will allow for community colleges within the Tennessee Board of Regents system to be compared based on matriculation rates and various demographics. Data from each of the 13 Tennessee community colleges data were analyzed independently for a five-year period (2016 – 2021).

DEDICATION

I would like to dedicate this to my beautiful wife who has helped shower me with love and support more than she will ever know. She has pushed me to move forward even when I felt like there was no end in sight. Tori, I can never tell you enough how much I appreciate the support during weekends, vacations, and late nights as I worked to pursue this dream. You are the reason I decided to pursue this degree and the reason that I have finally come to complete this degree. I also want to dedicate this to our new baby girl, Ryan Delaney Cutshall. Ryan, you are what pushes me to be better day in and day out. Lastly, I want to dedicate this to all of the professionals who have helped me get to where I am today. This one is for all of you. I never thought as a teenager that a doctoral degree was in my future, but I am excited for the road ahead.

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TABLE OF CONTENTS

LIST OF TABLES

Chapter 1. Introduction

As college tuition rates rise families are working to find ways to save money on college. Tuition and fees at degree-granting institutions for first-time, full-time undergraduate students have increased across 4-year institutions. The National Center for Education Statistics (2022a) reported the largest increases in tuition and fees have come from private and public 4-year institutions. Public, 4-year institutions reported an average increase from $8,500 to $9,400, an increase of approximately 10.5%. Private, non-profit, 4-year institutions reported an average increase from $31,700 to $37,600, an increase of approximately 18.6%. While this does not account for scholarships that can be received, the takeaway is that college tuition has increased over the last 10 years and is most likely to continue to increase in the coming years (NCES, 2022a).

Dual enrollment can be difficult to trace back to its roots. However, there are a few programs that implemented what we refer to today as dual enrollment as early as the 1970s. One of the early dual enrollment programs began at Syracuse University in 1972. The program was referred to as the Syracuse University Project Advance. The goal of the program was to challenge students who had already met their graduation requirements at their high school. Instead of having students relax during their senior years and take less demanding courses, students were met with more challenging coursework that could provide a jumpstart on their college coursework (Syracuse University, n.d.). Another early, dual enrollment program was founded in 1985 in Minnesota. Minnesota created a system that would prepare academically gifted students for college. Minnesota also became one of the first states that mandated high schools to offer students dual enrollment courses to their students. Guidelines for dual enrollment were also put in place that included the number of courses that students could take.

Students were not charged for tuition or other associated costs (Kronholz, 2011). Some states, such as Tennessee, implemented dual enrollment as a part of a statewide initiative. Tennessee first addressed opportunities for higher academic achieving students as early as 1983 when Governor Lamar Alexander introduced the Better Schools Program. The Better Schools Program contained 10 points with one designed to offer academically gifted students a chance to participate in a residential summer program. The 10-point program later evolved into the Drive to 55 (Governor's Drive to 55, n.d.). The Drive to 55 program was implemented in 2013 with a goal of 55% of Tennesseans obtaining a college degree or certificate by 2025. One of the major objectives of the Drive to 55 was to help close the gap between graduating high school and completing a degree or certificate. One way to close the gap was to provide pathways to state-funded institutions through dual enrollment (Governor's Drive to 55, n.d.).

Dual enrollment offers a chance for high school students to begin taking classes at the college level while also being enrolled in high school. Dual enrollment is responsible for generating revenue for higher education institutions. Many states, such as Tennessee, offer financial assistance to students that go directly to the institutions providing dual enrollment. Bailey et al. (2003) reported that in the state of Utah, 75% of junior and senior year tuition at state universities is waived for students who earned an associate degree, by way of dual enrollment, by the summer after they graduated from high school. Tennessee offers the Dual Enrollment Grant that helps cover costs. Because of the uncertainties surrounding higher education enrollment numbers in the coming years, it is important for institutions to matriculate their dual enrollment students to their 2-year institutions as full-time, degree-seeking students upon high school graduation. In the case of the Tennessee Board of Regents community

colleges, students can take advantage of Tennessee Promise and potentially get the remainder of the cost of their associate's degree, or vocational certificate, covered by the state.

In 2022, dual enrollment could be seen in various school districts across the nation. The National Center for Education Statistics (2009) defined dual enrollment as high school students earning college credits for courses taken through a postsecondary institution. Students can earn college credits through community colleges, 4-year colleges, and trade schools. Dual enrollment can vary in the methods of instruction delivery. Courses can be taught at the high school by fulltime college faculty or adjuncts. Dual enrollment students can go to the college to take the course, or students can take the course online. As dual enrollment becomes more accessible to students, the purpose of dual enrollment remains the same, to challenge students and provide them with a jumpstart on college. One major incentive that should be recognized for dual enrollment becoming increasingly popular could be because of the cost. The state of Tennessee founded the Dual Enrollment Grant for high school students to get financial assistance towards dual enrollment credits at either 2-year or 4-year institutions. The Tennessee Dual Enrollment program provides opportunities for students to earn an initial technical credential or a semester of college credit free of tuition and fees, while still pursuing a high school diploma. The grant can cover the cost of classes, or clock hours at a TCAT institution, and varies depending on the sector. The grant can cover the first five courses (tuition and mandatory fees) minus books and other class supplies. If a student utilizes the grant for classes six through ten, the award amount is $100 per credit hour, maximizing up to $300 per course. (Tennessee Dual Enrollment Grant, n.d).

Dual enrollment programs have served as a revenue source for community colleges. However, one major issue looms in the higher education sector. Grawe (2018) discussed

decades of patterns in fertility, migration, and immigration. Grawe also referenced the economic recessions and the low birth rates in his models. This has also been referred to as the enrollment cliff for higher education. Grawe highlighted several statistics related to the forecasted changes in the higher education demographics. First, Grawe found that the number of high school graduates would reach a high in 2025, but will drop by 9% by 2030. States in New England, with the exception of Massachusetts, should expect at least a 20% decrease over the same period. Tennessee should expect a decrease of 2.5% to 7.5%. Another major cause for concern that Grawe found was regarding the likelihood of attending college. Grawe found that based on census data, students in the Northeast U.S. are 40% more likely to attend 4-year institutions than those in West and South Central regions. Grawe further discussed the Higher Education Demand Index (HEDI) which he developed to forecast higher education demand over the next 15 to 20 years. Grawe estimated how many 18-year-old students there will be in each section of the U.S. by year, and what fraction of those students are likely to attend college. Using the Higher Education Demand Index, Grawe noted that with the exception of 2025, in no year will the number of two-year college-going students rise more than 2% higher than the 2018 population. Furthermore, the birth rates will cut the number of two-year, college-going students by nearly 16% from 2025 to 2029. Tennessee is projected to experience the largest decrease in students attending 2-year institutions with a drop of at least 15% (Grawe, 2018).

Statement of Purpose

The purpose of this descriptive, quantitative study is to explore the matriculation rates for first-time, full-time freshmen at the 13 public community colleges in Tennessee who were previously enrolled in dual enrollment courses while in high school. Percentages, means, standard deviations, ranges, percentages, and proportions were used to describe the data from

the 13 public community colleges in Tennessee. Other variables (gender, race, number of dual enrollment credits earned, grade point average for dual enrollment classes, and ACT scores) were also reported. Findings will allow for community colleges within the Tennessee Board of Regents system to be compared based on matriculation rates and various demographics. Data from each of the 13 Tennessee community colleges data were analyzed independently for a five-year period. This study is based on previous studies, such as Fink et al. (2017), which discusses the lack of matriculation of dual enrollment students to community colleges. In the Fink et al. study, the researchers discovered that 84% of students enrolled at the community college where they first participated in dual enrollment. In Tennessee, 57% of former dual enrollment students ended up enrolling at four-year institutions as opposed to community colleges. Tennessee falls into the bottom 15% of the country in former dual enrollment students attending community colleges. Other than Fink et al.'s study, there are very few studies that discuss the matriculation of dual enrollment students to community colleges in Tennessee. Most literature surrounding dual enrollment students matriculating revolves around either overall matriculation rates or matriculation to 4-year institutions.

Research Questions

For this descriptive study, I investigated the following questions as they related to the matriculation for first-time, full-time freshmen at the 13 public community colleges in Tennessee who were previously enrolled in dual enrollment courses while in high school. Research Question 1. What is the total number of dual enrollment students for each of Tennessee's community colleges during the study years (2016-2021)?

Research Question 2. After graduating high school, what percent of dual enrollment students matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021)?

Research Question 3. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) by gender (male or female)?

Research Question 4. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) by race (Black, Hispanic, White, or other)?

Research Question 5. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on the total number of dual enrollment credits earned?

Research Question 6. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on GPA for dual enrollment courses?

Research Question 7. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on ACT scores?

Significance of the Study

The Tennessee Board of Regents reports growth of dual enrollment across the state; but there is less data on the matriculation of high school dual enrollment students. Studies such as An (2013), Banks et al. (2019), and Hunter et al. (2018) can be found that discuss the advantages and disadvantages of dual enrollment as well as the impact on retention and graduation. However, studies conducted on following dual enrollment students' enrollment patterns as they transition to their associate's degree or bachelor's degree are less common. The descriptive study will demonstrate an analysis of the matriculation students who enroll in dual enrollment at a Tennessee Board of Regents community college. Because the study is descriptive, it will not provide insight into the questions of why students choose to enroll in the community college where they were enrolled as high school students. Instead, the study will provide insight into the number of students or percentage of students who chose to enroll at community colleges following dual enrollment. The COVID-19 pandemic is another significant point. For many institutions across the country, COVID-19 caused schools to go remote. According to the National Student Clearinghouse, "Total undergraduate and graduate enrollment combined declined 1.1% over last fall, leading to a total two-year decline of 3.2% since 2020" (National Student Clearinghouse, 2022). While undergraduate and graduate enrollments decreased from the start of the pandemic, Tennessee saw dual enrollment rates remaining consistent. Tennessee reported 15,244 students in 2020, 15,403 in 2021, and 17,181 in 2022 (TBR, n.d). One of the key reasons that student matriculation and student enrollment are so crucial is because of the impending higher education enrollment cliff (Grawe, 2018). Kline (2019) has estimated that the number of college students will decline by over 15% after 2025. The decline in birthrates means that the state of Tennessee is predicted to experience a

large drop in college student enrollment as well. By better understanding the matriculation rates of dual enrollment students, the TBR can potentially use this data to be better prepared as college student enrollments decline.

The main benefactors of this study will likely be the Tennessee Board of Regents and the 13 Tennessee community colleges. The TBR will be able to compare institutions and demographic information on matriculate rates of their dual enrollment students. The TBR will be able to review matriculation rates based on demographics. This study is designed to serve two key needs; 1) To learn more about the matriculation of dual enrollment students at community colleges in Tennessee. 2) To serve as a report for the TBR institutions in which they will be able to see potential gaps between their institution and the rate at which they matriculate their dual enrollment students.

Definitions of Terms

The following terms are used throughout the study and are provided with definitions as follows:

Dual Credit - Statewide dual credit classes are college-level courses taught at the high-school level by trained high-school teachers. (TEA, 2020).

Dual Enrollment – A system in which high school students earn college credits for courses taken through a postsecondary institution. Students can earn college credits through community colleges, 4-year colleges, and trade schools (NCES, 2009).

First-Generation Student - A student whose parents did not attend a 4-year college or university (Marquette University, 2023).

Matriculation – The process of a student enrolling in a 2- or 4-year institution by the fall immediately following high school graduation (Moreno et al., 2023).

Tennessee Promise - A scholarship program focused on increasing the number of students in Tennessee who attend college in-state. The scholarship provides students a last-dollar scholarship, covering the cost of tuition and mandatory fees at any of the Tennessee state community colleges, colleges of applied technology, or other eligible institutions offering an associate degree program (Tennessee State Government [TN.gov], n.d.a).

Tennessee Board of Regents (TBR) - The largest system of higher education in Tennessee created by the General Assembly and now serves as the governing body of the Community College System as well as the statewide technical institutions. (Tennessee Board of Regents [TBR], 2020)

Limitations and Delimitations

This study is limited by the accuracy of reporting dual enrollment credit by the 13 Tennessee community colleges, and is limited by types of enrollment or academic variables. Variables that could not be measured were students who chose to not enroll in a TBR community college because of factors such as athletic scholarships, academic program offerings, scholarships, or students entering a trade. This study is also limited by the impacts of the COVID-19 pandemic. The pandemic had a major initial impact on course deliveries during the spring semester of 2020. The pandemic continued to impact the way courses were offered during the 2020-2021 academic year. This study is delimited to students who had previously completed dual enrollment courses at one of the 13 Tennessee Board of Regents community colleges between the fall semester of 2016 to the spring semester of 2021. Using the fall semester of 2017 as the lower frame allows students who might not have been seniors enrolled in dual enrollment courses to still matriculate post-graduation and be counted in the study. Using 2021 as the upper frame allows for students who may not have been seniors enrolled in dual enrollment courses to

also be considered for this study. This study is also delimited to students who received credit for at least one dual enrollment course at a TBR community college. This excludes students who may have taken a dual enrollment course at a Tennessee College of Applied Technology. Delimitations to the study also include students who matriculated post-high school graduation to enroll as a first-time, full-time student at a TBR community college. By reviewing students who have graduated from high school and matriculated to the same community college where at least one dual enrollment course was completed, I will be able to provide generalized statements about matriculation rates.

Overview of the Study

This study has been organized into five chapters. Chapter 1 includes an introduction to the topic, statement of the problem, research questions, definitions of terms, the significance of the study, the definition of terms, delimitations and limitations, and an overview of the study. Chapter 2 contains a review of the literature surrounding the topics of dual enrollment. Some of the topics include a history of dual enrollment, state assistance programs surrounding dual enrollment, matriculation and pathways programs that are currently in place, as well as studies conducted on various populations participating in dual enrollment courses. In Chapter 3, I discuss the research method of the study. Chapter 4 displays the descriptive statistics and the findings of the study. Chapter 5 contains the summary, conclusions, and recommendations for practice and further research on dual enrollment matriculation.

Chapter 2. Review of Literature

The following chapter contains an overview of the literature to provide a foundation for understanding the various matriculation rates of dual enrollment students across the 13 Tennessee Board of Regents community colleges. The Tennessee Board of Regents is the governing body of the Tennessee community college system and oversees a combined annual enrollment of nearly 120,000 students from 13 community colleges, and offers classes in almost all of Tennessee's 95 counties (TBR, 2020). The following colleges were used for my study: Chattanooga State, Cleveland State, Columbia State, Dyersburg State, Jackson State, Motlow State, Nashville State, Northeast State, Pellissippi State, Roane State, Southwest, Volunteer State, and Walters State. The National Center for Education Studies (2019) promotes dual enrollment as "A means to help students prepare and demonstrate their readiness for the rigors of college coursework, as well as potentially save on the costs of college" (NCES, 2019, para. 2). Today, these courses are offered in multiple delivery methods. Some courses are taught at the high school, while others are taught on-campus at a community college, or in an asynchronous online setting. This chapter contains a review of topics relating to dual enrollment and the matriculation of students. This chapter also includes the history of dual enrollment and the Tennessee Board of Regents, in particular how dual enrollment was implemented in Tennessee community colleges and the growth of dual enrollment. Policies surrounding dual enrollment will also be discussed as there are programs that can potentially influence students' decisions on their college decisions, such as the Tennessee Dual Enrollment Grant and the Tennessee Promise scholarship. I also review the types of matriculation agreements that are currently in place. These matriculation agreements come in the form of pathways, articulation agreements, and other forms. Finally, I will discuss the various populations of students participating in dual enrollment.

History of Dual Enrollment in the United States

Dual enrollment programs can be found at almost all state-funded community colleges. The National Center for Education Statistics (2019), studied more than 23,000 ninth-graders in 2009. The NCES study showed that 34% of students participated in high school courses for higher education credit, and 80% of those students participated in dual enrollment courses at their high school. While there are data to support the growth of dual enrollment, the history behind dual credit and dual enrollment programs is not as clear. Kulik and Kulik (1984) stated that special school programs for academically gifted students began in St. Louis school districts as far back as 1862. These programs were meant to serve as reclassification and promotion of students who were distinctly higher achieving than their peers. Supporters of the accelerated programs believed that it enabled students to work with similar peers over students their ages (Kulik & Kulik, 1984). Another one of the first dual enrollment programs began at Syracuse University as early as 1972. This program was called the Syracuse University Project Advance (SUPA). The goal of SUPA was to challenge students who had already met their graduation requirements at their high school. Instead of having students take less demanding courses, students were met with more challenging coursework that could provide a jumpstart on their college coursework (Syracuse University, n.d.). Syracuse University would also later be responsible for the founding of the National Alliance of Concurrent Enrollment Programs or the NACEP. In 1999 a conference was held by Syracuse University with 20 institution representatives to adopt bylaws and form a mission statement to guide dual enrollment programs (NACEP, n.d.). These bylaws provided standards that institutions could follow. As of May 2020, 116 concurrent enrollment programs are now accredited by the NACEP through Syracuse University. In 1985 Minnesota created a system that prepared academically gifted students for

college (Kronholz, 2011). Minnesota's state regulations mandated that schools must offer students dual enrollment courses. Minnesota was also one of the first states to set guidelines for dual enrollment. Some of the guidelines included the number of courses that students could take, and that students would not be charged for tuition or other associated costs. Kronholz (2011) also discussed the creation of the dual enrollment program at Indiana University-Purdue University Indianapolis. In 1984, the director of the campus honors program opened liberal arts classes to gifted and talented kids. In 2006, the Texas legislature passed a law stating that each local educational agency must offer a program where students could earn 12 credit hours, of college credit while in high school. In this legislature, it was also noted that each educational agency could have multiple agreements with various institutions. This allowed educational agencies to determine what higher education institutions offered the best coursework for their students and also offered a variety of pricing for dual enrollment programs (TEA, 2011).

History of Tennessee Board of Regents and Dual Enrollment in Tennessee

The state of Tennessee has become a leader in both free community college and dual enrollment initiatives (Hunter & Wilson, 2018). The historical beginnings of Tennessee's growth in postsecondary education can be traced back to as early as 1983. In 1983, Governor Lamar Alexander introduced the Better Schools Program. This program was a 10-point program to address improvements in both secondary and postsecondary institutions (Shaw, 2019). In this program, Governor Alexander included the following 10 plans of action:

- The first point of action was to build better basic reading and math skills that must be mastered in elementary school.
- The second point was for students to receive basic computer skills before the start of the ninth grade.

- The third point was to require all students to participate in Kindergarten.
- The fourth point was to double math and science credits taken in high from one credit to two.
- The fifth point was to offer academically gifted students a chance to participate in a residential summer program.
- The sixth point was to emphasize vocational education classes relating to real-world jobs.
- The seventh point was the creation of alternative schools for students with disciplinary issues.
- The eighth point was to place vocational training at the post-secondary level under the Tennessee Board of Regents.
- The night point was to better finance higher education institutions across the state.
- The tenth point was to create a master teacher and master principal program. (Shaw, 2019)

These programs were meant to create incentives and bring about the best and brightest teachers and principals (Husen & Cody, 1985). Tennessee also became one of the first states to revise a funding model as a way to improve educational attainment throughout the state (Perna et al., 2017). This model was referred to as the Drive to 55. The Drive to 55 was implemented in 2013 as a goal to bring together various educational sectors across the state to reach the goal of 55% of Tennesseans obtaining a college degree or certificate by 2025. The Drive to 55 Alliance stated that the goal is to help support the long-term steps needed in college entry and completion, adult education and training, and identifying and closing skills gaps to better prepare our workforce and our state for the future (TBR, n.d.). Because of the Drive to 55 program other programs for

students, such as the Tennessee Promise and the Tennessee Reconnect, were implemented. Karp (2014) reported college completion as being a pipeline issue. Karp emphasized the importance of a "postsecondary pipeline that requires that students be academically ready and financially able to enter college" (Karp, 2014, p. 2). Karp's report was released in 2014 and served as a way to develop a variety of recommendations that would strengthen dual enrollment in Tennessee. This was to ensure that the program would meet the completion goals of the Drive to 55 initiative (Karp, 2014). The policy report stated two major points of interest. The first was that statistics showed that dual enrollment encouraged college completion. The second point was that peer states supported dual enrollment. The states that were referenced in the report were: Texas, Georgia, North Carolina, Kentucky, and Florida. The report also indicated that Tennessee stakeholders supported dual enrollment as a strategy to meet college completion. Karp's major encouragement in the policy recommendation was, "Tennessee should develop a dual enrollment program that is coherent, inclusive, aligned with other state initiatives, and cost-free to students and families" (Karp, 2014, p. 3). Governor Bill Haslam has also been a proponent of the growth of post-secondary attainment in Tennessee (Perna et al., 2017). On April 27th, 2012 Governor Haslam signed a bill that stated a plan would be put into place that would not prevent any higher education institutions from initiating dual enrollment programs with high schools. The bill also helped initiate a plan that set certain standards for dual enrollment courses that would be part of the Tennessee transfer pathway. These pathways ensured that the dual enrollment courses offered would be accepted and the student would receive credit for the course at Tennessee higher education institutions (Perna et al., 2013).

Growth of Dual Enrollment

The National Center for Education Statistics posted a report in February 2013 detailing the growth of dual enrollment programs across the country. The NCES report shared several promising statistics. In regards to the overall student population, institutions reported that roughly 1,277,100 students took college credit courses through a dual enrollment program. The report also showed that 83% of dual enrollment programs were taught at the college campus, 64% of the program's courses were taught at the high school campus, and 48% of the programs' courses were taught through distance education. The NCES report provided insight into the grades of students who were enrolled in dual enrollment programs. The majority of students enrolled were in 11th and 12th grades (91% in 11th grade and 97% in 12th grade), while 40% of institutions enrolled students in the 10th grade, and 25% of institutions enrolled students in the 9th grade. The National Center for Education Statistics also reported a comparison between dual credit and exam-based courses. Of the high schools surveyed 82% offered students a chance to enroll in dual credit courses, while 69% of the schools offered students a chance to be enrolled in AP or IB courses (Thomas et al., 2013). This particular report by the NCES also surveyed high schools on the populations enrolled in academic-based dual credit programs versus those enrolled in a vocational-based dual credit program. The authors found that approximately 51% of high schools reported students took dual credit courses with an academic focus while 34% took dual credit courses with a vocational focus. To further elaborate, this report stated an enrollment of approximately 1.4 million students enrolled in an academic-focused dual credit program with approximately 601,000 students enrolled in a vocational dual credit program. One major takeaway from this report is the number of students receiving degrees and certificates through these programs. Fourteen percent of high schools reported they had students who earned a

certificate, while 7% of high schools had students who earned an associate's degree. More recently, the National Center for Education Statistics released a report in February 2019 with updates surrounding participation in dual enrollment programs. Researchers at NCES studied 23,000 students as a ninth-grade cohort from 2009-2013. In this study, 34% of students in the cohort ended up participating in at least one dual credit course. The study also documented the main delivery method of the dual credit courses. Eighty percent of students participating in the dual credit courses attended their classes at their high school (NCES, 2019). Students taking dual credit courses at a college campus were next with 17% of students participating in courses on a college campus. Updated data on dual enrollment participation is more difficult to locate. Many states, such as Florida, are experiencing increased enrollment in their dual enrollment programs. In Florida, fall enrollment numbers of dual enrollment students doubled from 2009 to 2017 (Yuen Ting Liu et al., 2022). In another report (Thomson, 2017), Florida's numbers grew by 16,000 students between 2012 and 2016. In Thomson's report, he also praised Idaho for its efforts as being at the forefront of dual enrollment access. The state of Idaho moved to provide scholarship funds for students in grades 7 through 12 on dual credit courses. This became what was referred to as the Advanced Opportunities Program. Since the addition of the Advanced Opportunities Program, the state of Idaho has seen an increase in dual enrollment populations from 16,264 students in the 2015-2016 academic year to 70,395 during the 2018-2019 academic year (Eden, 2020). California is another state that has seen dramatic growth in its dual enrollment programs. Rodriguez and Gao (2021) reported that more than 112,000 high school students graduating in the 2019–20 school year enrolled in college courses and earned college credit, representing an increase of 56% from 2015–16. The Tennessee Board of Regents reports dual enrollment participation on its website (TBR, n.d.). The TBR reported an increase in its dual

enrollment participation from 9,884 students in 2011 to 15,244 students in 2020, and 16,519 students in 2019. This is approximately a 54% increase from 2011 to 2019. It is important to note that the report listed by the TBR only takes into consideration the number of students enrolled in dual enrollment programs through the state's community college system (TBR, 2019). Motlow State Community College has seen the largest increase from 2011 to 2020 enrollment spanning from 713 reported students in 2011 to 1,844 in 2020. On the other hand, Dyersburg State Community College has seen fluctuations in enrollment beginning with 704 students in 2011 to 951 students in 2017 to 633 students reported in 2020. Various states are seeing growth in their dual enrollment participation with each state having its own policies on how they plan to meet the needs of high school students and provide them with post-secondary opportunities.

State Assistance Programs in the United States

Major credit should be given to state-run assistance programs when reviewing the growth of dual enrollment programs. While the funding for dual enrollment programs can vary depending on the state, several states are now funding dual enrollment programs. Kentucky implemented the Kentucky Dual Credit Scholarship program. The Kentucky program covers the cost of tuition for two dual enrollment courses per year (KHEAA, 2022). These courses must be in a general education subject and are open for juniors and seniors. For students who wish to take more than 2 classes per year, the cost of the courses is discounted by 50%. One stipulation to the program is that students must complete a 30-minute college success counseling session each year that the scholarship is offered. Georgia also funded the Georgia Dual Enrollment Program which covers the costs of dual enrollment courses for students attending a Georgia high school or homeschool. The funding caps at 30 semester or 45 quarter hours and differs from Kentucky in that Georgia institutions are allowed to charge traditional tuition rates versus a discounted rate

(Tba, 2022). The funding program is available for a maximum of 15 semesters or 12 quarter hours per term. In Georgia, dual enrollment offering institutions are required to waive all mandatory and non-course related fees and are not allowed to charge tuition, fees, or book costs. One difference in Kentucky is that institutions must provide the required textbooks for the course at no additional cost to the students. North Carolina offers the Career and College Promise (CCP) which was implemented in 2012. The Career and College Promise program offers high school students tuition-free college credit options in the college and career (vocational) routes. The CCP partners with public 2-year, public 4-year, and private 4-year institutions located in North Carolina. Within the CCP program, there are three pathways. The first is the College Transfer Pathway (CTP) where students can participate in tuition-free courses that are geared towards an associate's degree or a 4-year degree. The second pathway is the Career and Technical Education Pathway (CTE) which allows students to participate in tuition-free courses that are geared towards an entry-level job credential or certificate. The third pathway is the Cooperative Innovative High School Programs (CIHS) which provides opportunities for students to complete an associate degree program or two years of college credit within a span of five years. This pathway typically comes in the form of middle-high and early-high colleges (NC Community Colleges, 2014). Tennessee has also put multiple scholarship programs into place that benefit students from dual enrollment students to undergraduate degree-seeking students. The Dual Enrollment Grant (TN.gov., n.d.a) was designed for students attending an eligible Tennessee high school who simultaneously are enrolled in college courses at an eligible postsecondary institution where they receive college credit. The goal of the Dual Enrollment Grant was for students to earn an initial technical credential or a semester of college credit free of tuition and fees, while still pursuing a high school diploma. For students pursuing courses at the 2-year or 4-

year postsecondary institutions, the first 5 courses are tuition-free, with courses 6 through 10 covering partial costs of courses. By utilizing the Dual Enrollment Grant, students can get a jump start on obtaining a postsecondary credential or degree. After Tennessee students graduate from an eligible high school, they are eligible to receive the Tennessee Promise and the Tennessee HOPE Scholarship. Both are programs that offer additional financial assistance to students toward their postsecondary education. The Tennessee Promise provides eligible students with a last-dollar scholarship covering the cost of tuition and mandatory fees not covered by other state or federal aid (TN.gov., n.d.b). Students can utilize Tennessee Promise if they choose to attend any of the state's community colleges, colleges of applied technology, or any other eligible institution that offers an associate degree. This could include public and private 4-year institutions in Tennessee. Students using Tennessee Promise funds at 4-year institutions may not receive full last-dollar scholarships, however, it does provide additional funding. In addition, the Tennessee HOPE Scholarship was also created to provide students with financial assistance with their postsecondary education. The Tennessee HOPE Scholarship is awarded to students who enroll at an eligible postsecondary institution within 16 months of their high school graduation. Students must have a minimum of 21 ACT (equivalent minimum of 1060 SAT) or a minimum 3.0 grade point average from high school (TN.gov, n.d.b). Students who are awarded the Tennessee HOPE Scholarship are offered funds at both 2-year and 4-year institutions in Tennessee. Students choosing to attend a 2-year institution receive up to $1,600 per semester as a full-time enrolled freshman or sophomore. Students choosing to attend a 4-year institution receive up to $2,250 per semester as a full-time enrolled freshman and sophomore; then up to $2,850 per semester as a full-time enrolled junior and senior. While the assistance that states offer for postsecondary education can vary, additional funding can play a major role in where

students choose to attend. For instance, a Tennessee student who graduates from an eligible high school could participate in a semester of dual enrollment courses at no cost, then matriculate and utilize Tennessee Promise funding for the remainder of their associate's degree at a 2-year institution, and can eventually receive Tennessee HOPE Scholarship funds for their undergraduate degrees. The culmination of the three scholarships can save students and their families thousands of dollars on an undergraduate degree in the state of Tennessee. State assistance programs can potentially play a part in the decisions of students for their post-secondary education (TN.gov., n.d.b).

Matriculation and Pathway Programs

There are limited studies on the rates of matriculation to community college from dual enrollment. Fink et al. (2017) reported on the transition to college as it relates to dual enrollment. In this study, it was found that for students who participated in dual enrollment, there were positive effects on college degree attainment, college access and enrollment, credit accumulation, high school graduation, and overall general academic performance. The highest effects were related to college degree attainment. Fink et al. formed a cumulative report on the positive effects of dual enrollment. In regards to college degree attainment, Fink et al. showed that there was a significant positive effect for dual enrollment in helping students either obtain a certificate, associate degree, or bachelor's degree. Young (2021) documented the impact dual enrollment had on completion time, specifically at a Tennessee College of Applied Technology institution. These institutions provide technical programs that provide students with certificates in programs, such as welding, automotive, and other technical programs. In Young's study, he addressed whether there was a significant difference in the number of credit hours of dual enrollment students between those who received a credential and those who did not. Young found that

students who were in the credential group obtained more than double the hours of dual enrollment than students who did not receive a credential. Young also found that students who had participated in some dual enrollment while in high school were significantly more likely to earn a diploma than their peers who did not participate in dual enrollment. Both of these studies provided insight into the impacts of dual enrollment as it relates to college completion. However, they do not discuss matriculation into the same institution where students participated in the dual enrollment courses. Fink et al. (2017) are credited for learning more about where students attend after high school graduation. The researchers discovered that more than one-half of dual enrollment students who move on to attend college attend a community college. Eighty-four percent of students enrolled at the community college where they first participated in dual enrollment. They also discovered that in Tennessee, 57% of former dual enrollment students ended up enrolling at four-year institutions as opposed to community colleges. Tennessee falls into the bottom 15% of the country in former dual enrollment students attending community colleges. Fink et al. also observed that among former dual enrollment students who did attend a community college after high school graduation, 21% received an associate degree or higher, and 25% received a bachelor's degree. Tennessee was listed in the top 25% of states in the U.S. for former dual enrollment students earning an associate degree or higher at 51%. Florida has the highest percentage at 64% and West Virginia has the lowest percentage at 28%. Wilson (2019) also examined the matriculation of regional Kentucky students who participated in dual enrollment through West Kentucky Community and Technical College (WKCTC) and who later matriculated at WKCTC. Wilson specifically wanted to review whether there was a relationship between the number of hours obtained through dual credit and the matriculation rates to WKCTC post-high school graduation. Wilson grouped the number of hours earned from 1-24, 25-36, and

37-73. Approximately 86.4% of the student population fell within the 1-24 total dual enrollment hours. Another area she wanted to explore was the relationship between the high school's distance to WKCTC and matriculation rates. Wilson discovered that matriculation rates from students who participated in dual enrollment from a high school 10 miles or less away (49.1%), as well as from 11-30 miles away (42.3%) from WKCTC were more likely to matriculate than those from a school outside of 30 miles (8.6%). Overall, Wilson provided insight into matriculation rates to a community college from regional high schools serving dual enrollment students. Moore (2021) examined the process of matriculating students and the community college faculty's role in encouraging dual enrollment student matriculation. Moore was interested in studying whether participation in a dual enrollment program had any impact on students' choice to enroll as a degree-seeking student with the host institution. Moore's study included 14 former dual enrollment students from Appalachia Community College (ACC). From the qualitative study, Moore discovered that a majority of the participants pointed out that faculty had played a part in their decision to matriculate. Moore stated that students chose to matriculate to the community college based on various characteristics (also known as layers) being met. These layers included individual habitus, high school and community context, higher education context, and social, economic, and policy context. The individual habitus and high education context were both related to whether or not the faculty gave students the necessary support. The high school and community context was related to the overall experience the students had in their dual enrollment and whether it was a positive enough experience to persuade them to wish to continue with those same faculty members on a full-time degree seeking basis. Also, the social, economic, and policy context layer was related to state funding and grants that assisted in making sure the community college was adequately funded to serve students. Moore's study

provided each student's contextual information as well as their dual enrollment experience to show trends that led to their decision to either transfer to a different institution or matriculate as a degree-seeking student at that same community college. The major theme was related to the faculty at ACC and the positive experience that students had played a major role in continuing their education with ACC. Other themes included; classroom learning environment, saving money on their education, the location of the community college, the progress gained towards a degree, and majors offered and the transfer options for each major. Moore's study provided insight into the roles that faculty play in encouraging dual enrollment students to become degree-seeking students at that same institution, and could be useful for community colleges in helping to matriculate their students versus having to enroll students outside of dual enrollment. The Tennessee Higher Education Commission (THEC) and the Tennessee Student Assistance Corporation (TSAC) (n.d.), produced a report on the high school class of 2022 in Tennessee and their college going rates. They researchers found that students considered dual enrollment grantees have increased slightly from 2018 to 2022. In 2021, 27.6% of the graduating class was a dual enrollment grantee. The highest increase was in 2020 at 30.3%. The grantee perecentage dropped from 30.3% in 2020 to 28.2% in 2021, and 28.1% in 2022. The researchers also found that dual enrollment grantees college going rates have decreased from 2018 to 2022. In 2018 the college going rate was 85.2%, and the college going rate of the 2022 class was 78.4%. The only increase was from 2021 to 2022 from 78.1% to 78.4%. Lastly, the researchers found that full cohort college going rate, including those who did not use dual enrollment grants, has also declined from 62.5% in 2018 to 54.3% in 2022. This information helps to better understand how the graduating classes of high school student involved in dual enrollment matriculate to colleges.

With Grawe's (2018) projected enrollment cliff on the horizon, colleges will find it more difficult to maintain enrollment. Many community colleges have pathway programs in place for students who complete their associate's degree to seamlessly transfer to another institution to complete their bachelor's degree. The pathway programs are set up on an institutional basis and required classes and credits may vary depending on the institution the student wishes to attend. Traditional transfer pathways have been in place for many years, and dual enrollment pathways are now following a similar model. In a dual enrollment pathway program students participate in the agreed upon courses as a part of a dual credit program. If the student meets the requirements, sometimes based on grades, number of credits, or other requirements, the student will be able to seamlessly transfer to that institution to complete their degree. Many institutions have created pathway programs for dual enrollment students as a way for students to receive course selection and academic support. In some cases, community colleges do not make their dual enrollment students reapply after the high school requirements are met. Hoffman (2009) referred to dual enrollment pathways as programs where students participate in predetermined college courses. These courses are selected to meet postsecondary certificates or general education requirements for two-year institutions which are transferable. The author reported that to qualify for a dual enrollment pathway, students may graduate with one to four semesters of college credit courses (Hoffman, 2009). In 2008 California implemented the Concurrent Courses Initiative (CCI) as a way to meet the demands for decreasing the state's high school dropout rate. The state recognized that a large percentage of the students dropping out were interested in a career in the technical and vocational fields. To meet these students' needs, "implementation of rigorous and supportive pathways that integrate CTE and academic curricula through the use of dual enrollment and support services and that lead to postsecondary credentials" Rodriguez et al. (2022) stated that

students enrolled in the CCI program consistently led to higher graduation rates for students enrolled in dual enrollment programs than for their peers not enrolled. While these particular examples of pathway programs make no mention of students matriculating to given institutions, some institutions have made this to be a major goal. Caradona (2012), discussed the articulation agreements between high schools and community colleges in Virginia. Caradona's study highlighted the role of the community college in regards to initiating, developing, and implementing dual enrollment programs. Caradona studied 21 community colleges in Virginia. She interviewed the dual enrollment coordinators at each institution and found that of the 21 institutions, two institutions had partnerships with 2-3 schools, 9 institutions had partnerships with 4-5 schools, and 13 institutions had a partnership with 6 or more schools. Carandona also examined the policy elements that were discussed for each partnership. She found that 95% of the coordinators interviewed discussed the awarding of credits, an effective period for the agreement, and payment of tuition. On the other end, the lowest percentage of guidelines discussed included provisions for the renewal of the agreement (55%) and the payment for textbooks (65%). Additionally, faculty being shared by institutions and high schools was also at 60%. Sharing faculty could be dependent on the way the courses are being delivered. For instance, if the courses are asynchronous and offered online, the high school would most likely not need to use any of its faculty. Caradona also discussed the admission requirements for students to enroll in a dual enrollment program and what was used as eligibility criteria. Surprisingly, only 15% used student cumulative grade point averages to determine if a student is eligible for dual enrollment, 50% of the institutions used recommendations from high school administrators to determine eligibility, and 85% of institutions used a college placement test to determine eligibility. Caradona asked coordinators to discuss any enrollment restrictions.

Seventy percent of institutions had no restrictions while the other 30% of institutions listed the number of courses or course loads as the main restrictions. In regard to the student's matriculation status, coordinators were asked if students applied their credits toward a degree or certificate at their institution. The institutions had a mean of approximately 25% of students who applied their credits towards a degree or certificate at the institution at which they were enrolled. Holley (2016) examined the articulation of dual credit to student degree plans through a public higher education institution in Texas. The study consisted of 143 students from varying majors such as Interdisciplinary Studies, Kinesiology, Nursing, Business Administration, and Psychology. The number of credits of dual enrollment taken by students ranged from 3 to 54 semester hours. A total of over 700 dual enrollment courses were examined. Of these courses, 91% of the courses were applied towards a student's degree. From the majors examined, Business Administration had the highest number of credits transferred (98.62%) with Nursing listed as the lowest major for number of credits transferred (85.13%). Holley's study provided insight into how dual enrollment programs build their dual enrollment programs by major. To further elaborate on Nursing programs and dual enrollment, Bopp and Einhellig (2017) discussed the planning and implementation of a dual enrollment program between an associate degree in nursing and a baccalaureate degree in nursing. The goal was to streamline the process for students beginning their first years at a community college. Bopp and Einhellig described how community colleges and universities came together to create a plan where students at a community college can begin taking classes through both institutions. This assisted in shortening the time between the associate degree and bachelor's degree for these nurses. Bopp and Einhellig's study does not include high school students, but is an example of how pathway programs can be utilized.

Demographics in Education

Equity in education is falling under the microscope in the world of higher education. In looking at the retention and graduation rates of males and females, there is clear evidence of a gap in both areas. The National Center for Educational Statistics (NCES, 2022) stated that the 6-year graduation rate in 2014 was higher for females (67%) than for males (60%). Other evidence shows that the largest gap is found at private nonprofit institutions in which a 6-year graduation is completed by 71% of females and 64% of males. However, the gap is considerably smaller at the 2-year level in which females at public 2-year institutions graduate at a 31% rate while males graduate at a 28% rate. Parker (2021) studied some of the reasons that women outpace men in college-going and college graduation rates. Parker reported that the percentage of males and females 25 years of age and older were similar in 2014 to 2015. In 2021, the number of females 25 and older with a bachelor's degree outweighed males by 2%. In comparison, women between the ages of 25 and 34 outnumbered same age males by 10%. Parker also referenced a PEW Research Center study that investigated the reasons why adults do not have a bachelor's degree or are not enrolled in college. Thirty-nine percent of men and 44% of women stated they could not financially afford a four-year degree. Other popular responses included the need to work to support a family (35% males and 38% females), did not need more education for their career field (20% females and 26% males), and simply not interested in attending college (25% females and 34% males). Gándara and Li (2022) studied financial aid promise programs at the 2-year public colleges and the enrollments associated. For their study promise programs were defined as, “those that award financial aid to students based on their geographic location” (para 8). This study is noteworthy because Tennessee has implemented a promise program for high school graduates. Gandara and Li investigated the enrollment patterns within promise programs based

on racial and gender classifications. Gandara and Li found an average of 23% increase in enrollments of promise institutions versus non-promise institutions. More specifically their study documented that promise-eligible colleges witnessed a 47% increase in the enrollments of Black males and a 51% increase in enrollments of Black females. Similar results were found between genders in the Hispanic community. An increase of 40% was found for Hispanic males and a 52% increase for Hispanic females. Differences were found between White males and White females as well. It was discovered that promise programs significantly increased the first-time enrollment of White males by 32%, and had slightly less impact on the enrollments of White female students of roughly a 24% increase. In conclusion, it was found that enrollment increases for promise programs are largest for Hispanic and Black students, more specifically with female students (Gandara & Li, 2022).

Depenhart (2018) studied the difference in college persistence based on the gender of dually enrolled students in 11th and 12th grades. The purpose of Depenhart's study was to determine if there is a significant relationship between college persistence of dual enrollment students based on the method of course delivery and the student's gender. Depenhart's study focused on three questions. The first was whether there was a significant difference between the student's persistence and the course instruction model. The research showed there was no significant difference between students' persistence and the mode of course instruction. The second question was focused on the persistence of the students and gender (Depenhart, 2018). The research found that there was again no significant difference in the college persistence scores and student gender. The last question focused on the college persistence scores of the student based on gender and mode of course instruction. Again there was no significant difference in the college persistence scores of the student based on gender and mode of course

instruction. Although Depenhart's study did not produce statistically significant results, the study did show that men fall behind on college-going rates, for dual enrolled students, the persistence rates show no significant difference between males and females. Another study on dual enrollment outcomes was conducted by researchers for the Kentucky Council on Postsecondary Education (Kentucky Council on Postsecondary Education, 2020a). The authors discovered that there was a difference in second-year persistence rates between dual credit and non-dual credit students. Over 90% of non-participant persistence was males and 89.7% of non-participant persistence was females. When viewing participants' persistence rates, the gap was much closer. Female participants persisted at a 92.3% rate and male participants persisted at a 92.2% rate. The study also determined that the representation of the participants could be skewed because 60.5% of the population were females and 39.5% were males.

Racial equity in education has also become a growing concern in the United States. The National Association of Secondary School Principals reported that 50.7 million students enrolled in public elementary and secondary schools in the fall of 2017. A breakdown of the report showed that 24.1 million were White, while 7.7 million were Black, 13.6 million were Hispanic, 2.8 million were Asian/Pacific Islander, .5 million were American Indian/Alaska Native, and roughly 2 million were two or more races (National Association of Secondary School Principals [NASSP], 2021). The authors discussed how the percentage of White students in public schools fell from 61% to 44% from the fall of 2000 to the fall of 2017. In more urban areas, the majority of students are students of color, many from low-income families. The NASSP estimated that districts serving a majority of students of color receive nearly $1,800 less per student than school districts that serve predominantly White schools. Funding has become a major issue in the K-12 world of education, however in higher education major issues are retention and graduation rates.

Banks and Tester (2019), determined that the six-year completion rates at four-year institutions show that African American students were the least likely to graduate at 45.9%, with Hispanic students following next at 55%, and White students averaged a graduation rate of 67.2%. In regards to transferring students from community colleges, 1 in 10 Hispanic students graduated, 1 in 13 Black students graduated, while White students graduated at a rate of 1 in 5. When studying the graduation rates, another issue that is being addressed is the diversity of faculty members as it relates to graduation rates. Poliakoff (2022) studied the effects of faculty diversity on Black student-athlete graduation rates. Poliakoff revealed that some Division I institutions demonstrated more than a 30% gap between Black student-athlete graduation rates compared to non-Black student-athletes. In Poliakoff's study, 351 Division I colleges and universities were analyzed to find the impact that relationships of Black faculty members had on graduation rates of Black student-athletes. Poiliakoff determined that there was no significant correlation between the impact Black faculty members had on Black student-athletes. However, there was a significant positive impact on Black student graduation rates with an increase in the percentage of Black faculty members. While questions surround racial gaps in the realm of dual enrollment and whether they exist, the statistics on racial gaps regarding dual enrollment students show less of a gap than the gap in graduation rates. Dingess (2018) researched the completion times of dual enrollment students from racial minority groups. Dingess' study determined that there was not a significant difference in completion time between minority students and White and Asian students, the study did show that dual enrollment can be a major step in building the graduation rates for minority students. Xu et al. (2021) highlighted the racial gaps in advanced placement and dual enrollment participation across more than 1,000 school districts. Their study observed that the largest racial gaps came in advanced placement participation. There was a 9.8% gap

between White and Black student participation in advanced placement courses and a 6.9% gap between White and Hispanic students. For dual enrollment, there was a 4.7% gap between White and Black student participation in advanced placement courses and a 4.2% gap between White and Hispanic students. To maintain the validity of the study, the researchers only used school districts that had at least 20 White students and at least 20 students of color. In regards to individual state demographics, their study discovered that Tennessee had smaller gaps in advanced placement participation with White and Black students and White and Hispanic students. However, Tennessee was among the top 25% in the largest gaps between both White and Black students as well as White and Hispanic students for dual enrollment participation. Xu et al., also determined that some strong predictors of participation in advanced placement and dual enrollment programs included; pre-high school achievement, family socioeconomic background, between-school segregation, racial composition among high school students, average characteristics of high schools in a district, and state-level policies. Xu et al.'s study described possible factors that can lead to racial gaps. Rivera et al. (2019) used a population of 24,000 students from 944 high schools and showed that 63% of participants in dual enrollment programs were White, 8.8% were Black, and 16.39% were Hispanic. Similar to Xu et al.'s study, Rivera et al. proposed that despite equity intentions, socioeconomic status and prior achievement were strong predictors of student participation in dual enrollment. Overall, Black students were 37% less likely to enroll in dual enrollment courses with Hispanic students 25% less likely to enroll. The major takeaway from the Rivera et al. study was that dual enrollment was taken by mostly higher achieving students.

College enrollment numbers have increased over the years, but a larger college enrollment gap has also presented itself with low socioeconomic status students. The NCES

(2018) reported that the overall enrollment rate for high school graduates increased 7% from 2000-2016 to a total of 70%. Students from high-income families represented 83% of the enrollments, while students from middle and low-income families represented enrollments at 64% and 67% respectively. Overall, the enrollment gaps between low-income and high-income students shrank from 2000 to 2016 from 30% in 2000 to 16% in 2016 (NCES, 2018). The National Student Clearinghouse Research Center (2022) produced a benchmark report at the end of 2022 that revealed a variety of statistics. The results showed that graduates from high-minority and low-income high schools represented the lowest college enrollment rates at 49%. This equates to a gap of 17% between students from low-minority, and higher-income high schools. Additionally, low-minority, low-income schools show an enrollment rate of 52%, which is 3% higher than that of high-minority, low-income schools. The study also reviewed the six-year graduation rates of students from the 2014 class. Fifty-two percent of students from low-minority, high-income high schools graduated in six years. Students from low-minority, low-income high schools graduated at a 33% rate. The lowest six-year graduation rates were from high-minority, low-income high schools with a six-year graduation rate of 28%. In regards to persistence rates of students, the National Student Clearinghouse Research Center reported that there was a 9% difference between the persistence rates (first year of college to second year) of students from low-income schools (79%) and high-income schools (88%). Studies have also been conducted on participation in dual enrollment based on income level. Gagnon et al., (2021) analyzed access and participation in dual enrollment across different income levels. Their study was conducted in the Regional Educational Laboratory (REL) Central states (Colorado, Kansas, Missouri, Nebraska, North Dakota, South Dakota, and Wyoming). The study aimed to answer two questions. The first revolved around the rates of dual enrollment access and participation in

the REL Central states. The second question is whether the rates vary by school location or by the percentage of students who come from low-income households. The authors discovered a few different findings regarding access. First, dual enrollment participation was higher in the REL Central states than the national average but varied from state to state. The national average during the 2017-2018 academic year of dual enrollment participation was 21% of students. The REL Central states reported a 27% average enrollment. Gagon et al.'s study observed that not only were the participation rates higher than the national average, but also the access to dual enrollment. Five of the seven states had a higher rate of schools offering dual enrollment than the national average. In reviewing the rates of schools with higher percentages of low-income students, the study's authors determined that these schools were more likely to provide dual enrollment than schools with lower percentages of low-income students. In regards to participation, they also determined that students attending low-income prevalent schools were more likely to participate in at least one dual enrollment course versus students not attending low-income prevalent schools. These findings are not supported in other cited studies. Bettinger et al. (2022) wanted to learn how the Pell Grant impacted dual enrollment participation. The Pell Grant is a grant through the federal government that is provided to students who display exceptional financial need (Federal Student Aid and Office of the Department of Education, n.d.). The researchers aimed to answer whether allowing students to utilize Pell Grant funds would increase participation as well as increase postsecondary attendance rates after dual enrollment. Their study determined that due to the implications of Pell Grant serving institutions, dual enrollment participation was not increased when Pell Grant was used. On a similar note, the researchers did find that when students utilized Pell Grant funds there was no impact on the overall enrollment of low-income students. There was however a significant difference for

students residing in a high-poverty zip code to enroll at a 2-year institution versus not enrolling in an institution. Hyde (2020) helped provide further information by researching dual enrollment courses for low-income students as it relates to 2-year completion rates at Tennessee higher education institutions. Hyde observed that economically disadvantaged students are significantly less likely to show 2-year completion rates than non-economically disadvantaged peers. Economically disadvantaged students showed a 2.9% completion rate compared to a 6.4% completion rate of non-economically disadvantaged peers. Hyde also studied the 2-year completion rates of students who participated in a dual enrollment credit course. The results demonstrated that 2.8% of students classified as economically disadvantaged demonstrated 2-year completion compared to non-economically disadvantaged students who showed a significant difference at 7.8% 2-year completion rates. Additionally, Hyde researched whether there was a significant difference in the 2-year completion rates between economically disadvantaged students who received dual enrollment credit and economically disadvantaged students who did not receive a dual enrollment credit. The data revealed that students who are economically disadvantaged and received a dual enrollment credit (3.6%) are significantly more likely to demonstrate a 2-year completion rate than economically disadvantaged students who did not receive a dual enrollment credit (1.7%).

A first-generation college graduate refers to a person who has completed at least a bachelor's degree but does not have a parent who has completed at least a bachelor’s degree. Fry (2021) determined that outcomes vary greatly for students with parents who had completed a bachelor’s degree compared to those students who were first-generation. Fry documented that the median household income for students with a parent who holds a bachelor’s degree was $135,800 as compared to families with no bachelor’s degree holding parents at $99,600. Having

parents who hold a bachelor's degree can also be an indicator for future success. Fry found that 20% of students graduate who have no parents with college experience. This varies drastically from the 60% that graduate who have at least one parent with a bachelor's degree and the 82% that graduate who have two parents that have obtained a bachelor's degree. Fry also determined that the type of institution varies for first-generation students compared to their peers. Eighty-five percent of students with parents who hold a bachelor's degree attend a 4-year institution versus the 15% that are first-generation that attend a 4-year institution. In addition, students with parents who hold a bachelor's degree attended more selective schools at a 51% rate while those who are first-generation attended selective schools at a 23% rate. Fry also observed that first-generation college graduates are 8% less likely to obtain an advanced degree than students with parents who hold a bachelor's degree. Overall, students who are first-generation students are already at a disadvantage compared to peers with parents who hold a bachelor's degree. Manzoni and Streib (2018) backed Fry's data by also discovering that continuing-generation students, also known as students who have at least one parent with a bachelor's degree, are more likely to attend selective colleges than their first-generation peers. Manzoni and Streib most notably found differences in the representation of majors from continuing education and first-generation students. Manzoni and Streib concluded that continuing-education students are more likely to major in the arts and humanities and continuing-education men are more likely to major in social sciences and STEM than first-generation males. Manzoni and Streib also discovered an 11% generational wage gap between continuing-generation males and a 9% generational wage gap between continuing-generation females. One of the major key takeaways from this study is that the number of first-generation college students and continuing-generation college students were disproportionately represented, especially in more selective universities. This shows that first-

generation college students are already under-represented across very highly selective institutions. In relation to gaps for first-generation students in dual enrollment, Kiemele (2020) wrote an essay on the relationships between dual credit experience and self-efficacy in first-generation college students. Kiemele interviewed three first-generation college students with the intent of learning more about dual credit experience. She found that all three students completed their first two years of college and matriculated to that institution for their junior year. Two major themes emerged in the study, intrinsic and extrinsic motivations. Two students stated they had prior motivation to attend college which led them to complete dual enrollment credits. The other student did not share intrinsic motivations, instead stated that he took dual credit courses at the advice of his counselor. In relation to preparedness for college, two students felt that dual credit courses better prepared them for college. In terms of confidence, two of the students stated that their confidence was lower while completing the courses. One student stated that they were intimidated by seeing all of the smarter students in one classroom. One student did not report a major boost in preparedness for college. He reported that taking a dual credit course at the high school did not instill the true characteristics of a college course. Regarding academic self-efficacy, two students reported that the dual credit courses helped them learn better study habits, test-taking strategies, and memorization skills. They also felt as if they learned better time-management skills and felt as if they could take on a heavier workload in college. Overall this small study helped provide insight on what first-generation students may experience during dual credit courses. Bennett (2020) researched first-generation college students in the Appalachian region. The purpose of Bennett's study was to understand the first-generation student population in Southwest Virginia who participated in dual enrollment. This student, as with many relating to dual enrollment programs, covered the degree completion and retention of the students.

Bennett's study was a qualitative study that included 6 students, 2 counselors, 2 instructors, and 1 principal. There were 4 major themes found in Bennett's study. The first theme was based on parental influence. Both student and staff participants mentioned the influence parents had on first-generation student enrollment in dual enrollment courses. The subthemes were emotional support, lack of knowledge, and parental financial struggles. Key factors that impacted first-generation student enrollment included; parents not understanding dual enrollment and not having access to dual enrollment courses. The second theme revolved around academic preparedness. One of the main challenges for first-generation students in dual enrollment was a lack of study skills. Another subtheme that stemmed from study skills was students' lack of expectations. The staff members noted that students do not have a realistic expectation of dual enrollment classes. The third major theme was student support. This theme relates to the second theme in the lack of study skills. It was found that some students referenced the need for mentorship at the high school level for first-generation students in dual enrollment courses. Another subtheme was related to classroom support. The last and fourth major theme included dual enrollment experiences. The study demonstrated the need for first-generation students enrolled in dual enrollment courses to have a positive experience.

Because many colleges and universities are experiencing a decrease in enrollment, dual enrollment could take on an important role, especially at the community college level. Grawe (2018) is recognized for coining the term "higher education enrollment cliff." Grawe is also credited for developing the Higher Education Demand Index (HEDI). The Higher Education Demand Index was used to estimate the number of college-going students using basic demographic variables. Grawe's research provided several trends for institutions and demographics over the course of 2018 to 2026. Grawe pointed out that low birth rates have led to

less high student enrollment than in years past. Grawe forecasted that in 2025 the number of high school graduates will decrease by 9%. The New England region, except Massachusetts, and East North Central states is expected to see some of the largest drops in the number of high school student graduates at a 15% to 20% decrease. Tennessee is expected to see a 2.5% to 7.5% decrease in high school graduates. While many regions in the United States are predicted to see high school graduates decrease, areas in the Midwestern region are expected to see gains in graduates. However, Texas, Oklahoma, Colorado, and Utah are expected to see 7.5% increases in the number of high school graduates. Using this data Grawe created the Higher Education Demand Index which determined that the demand for college was equal to the probability of attendance times the number of children. Grawe also revealed that forecasted college-going student decreases will be most prevalent in major cities, such as New York, Philadelphia, and Boston. East of the Mississippi River, Atlanta, Georgia along with Charlotte, North Carolina are the areas that are projected to see notable growth. Tennessee is projected to experience decreases in high school graduates of 15% or more. Most notable in Grawe's study are the changes by race or ethnicity and first-generation rates. Tennessee will experience major decreases in college-going rates of all ethnic groups except Hispanic students. A 7.5% increase is projected for Hispanic high school graduation. In regards to parents with bachelor's degrees, Tennessee will see major decreases of 15% or more in 18-year-olds with either no parents or one parent with a bachelor's degree. Finally, Grawe examined the demand for 2-year and 4-year institutions. Grawe determined that the birth rate will decrease the 18-year-old population by 10%; but the number of 2-year college-enrolling students is expected to experience a disproportionate share of this change, dropping by 13% (Grawe, 2018). Grawe's study provided necessary insight for institutions across the country to plan long term for the changes ahead. While Grawe was the

main voice for the higher education enrollment cliff, there have been others since who have added perspective to the topic. Copley and Douthett (2020) also studied the enrollment cliff in higher education. Copley and Douthett referenced Grawe's prior research highlighting that the Middle Atlantic (NJ, NY, and PA) and East North Central (IL, IN, OH, MI, and WI) account for 56% of the overall drop in predicted college enrollments, but only 27% of the U.S. population (Copley & Douthett, 2020). Copley and Douthett most notably discovered that enrollments of international students have fallen by 6% since 2016. Campion (2022) also backed Grawe's research and provided insight into college selection variables that have been reported as reasons students choose institutions over others. The major selection variables were; legacy decisions (attending the same institution as parents), cost/tuition, being accepted, campus visits, desired major offerings, and institutional reputation.

Chapter Summary

Dual enrollment programs have grown immensely since its early inception began at Syracuse University in 1972. As of 2020, 82% of all public schools now offer dual enrollment programs (Taie & Lewis, 2020). Over the last 100 years of dual enrollment many states, including Tennessee, have begun creating funding opportunities for schools and students to promote dual enrollment. Legislative acts and policies such as the Drive to 55 initiatives in Tennessee have assisted in promoting dual enrollment, especially in the access of dual enrollment to underserved populations. With the concern of declining college enrollments, matriculating dual enrollment students can serve as a much needed enrollment boost for community colleges.

Chapter 3. Research Methods

This research was designed as a quantitative, descriptive research. Descriptive research serves the purpose of describing individuals, events, or conditions by examining them in their present condition. In a descriptive study, the researcher does not manipulate any of the variables but serves the purpose of describing the variables in relation to the sample. (Siedlecki, 2020) Descriptive studies can be designed to be purely descriptive as well as descriptive comparative. For this study, descriptive comparative will be used when analyzing the variables between the various TBR institutions. As with other research designs, descriptive research can have advantages and disadvantages. One of the major advantages of descriptive research is that the participants are observed in their natural settings with no variations. Another advantage is that the data can be used to identify the prevalence and potential problems and the demand for services to address the problems (Child Care and Early Education, n.d). In this study, the data was used to show whether or not gaps exist between institutions based on different variables. While the ability to identify potential problems that may occur, one of the disadvantages is descriptive studies cannot be used to establish cause and effect relationships (Child Care and Early Education, n.d). While the data provided by the TBR may show potential gaps, this study will not be able to establish any relationships on why there may be gaps. Another disadvantage can be the lack of ability to have generalizable data. Depending on the population, it can be common for the findings to not only lack the ability to be generalizable but also may not produce an accurate depiction of the population of interest (Child Care and Early Education, n.d). This study can provide data for the TBR community colleges in Tennessee, it will not provide any accurate depiction for additional states. For this study, a quantitative descriptive research design was the best method for analyzing the population of TBR institutions' dual enrollment

matriculation rates. This study will help to provide observations about potential gaps in the matriculation of dual enrollment students at various TBR institutions.

The National Center for Education Statistics (2009) reported that approximately 1,277,100 students took college credit courses through a dual enrollment program. Tennessee has witnessed an increase of more than 60% in its dual enrollment participation from 2012 to 2019. However, dual enrollment did experience a drop of almost 7% from 2019 to 2021 (TBR, n.d). The state of Tennessee took on the challenge of post-secondary education options in 1983 when Governor Lamar Alexander introduced the Better Schools Program. This program was a 10-point system to address improvements in both secondary and postsecondary institutions (Shaw, 2019). In this plan, vocational training was introduced at the post-secondary level under the Tennessee Board of Regents. Alongside vocational education, Governor Alexander intended to better finance higher education institutions across the state. However, it was the Drive to 55 Initiative that truly began the push for dual enrollment in Tennessee. The Drive to 55 was implemented in 2013 as a goal to bring together various educational sectors across the state to reach the goal of 55% of Tennesseans obtaining a college degree or college certificate by 2025. Karp (2014) reported on the Drive to 55 initiative that brought about the discussions of dual enrollment and how it could lead to meeting the goal of 55%. Karp discussed how peer states, such as Texas, Georgia, North Carolina, Kentucky, and Florida, supported dual enrollment. Karp's main recommendations were that "Tennessee should develop a dual enrollment program that is coherent, inclusive, aligned with other state initiatives, and tuition-free to students and families" (Karp, 2014, p. 3).

The Tennessee Board of Regents (TBR) has shown an increase in its dual enrollment participation from 9,884 students in 2011 to 15,244 students in 2020. The highest number of

students enrolled, 16,519, was in 2019. This equates to a 67% increase from 2011 to 2019. Motlow State Community College had the largest increase from 2011 to 2020. Dual enrollment went from 713 students in 2011 to 1,844 in 2020. On the other hand, Dyersburg State Community College saw fluctuations in enrollment beginning with 704 students in 2011, to 951 students in 2017, and 633 students reported in 2020.

Although the state of Tennessee was experiencing increases in dual enrollment students, there is a strong cause for concern in the higher education system because of the looming "enrollment cliff," a phrase that Grawe (2018) is credited with coining. Grawe predicted that Tennessee would be among the largest declining enrollment of high school students in the nation, with a decrease of over 15%. The issues surrounding the higher education enrollment cliff provided insight into the need for institutions to matriculate students, especially students who are already taking courses at their institutions. Purcell (2022) supported Grawe with her prediction that in 2026, the number of high school graduates will peak, which will result in an enrollment cliff. She went on to discuss another concern because fewer students were planning to attend college. Purcell referenced a survey of high school students regarding the likelihood of attending a four-year college. Purcell stated that the number of high school students planning to attend a four-year college is down from 20% to 53%. The survey highlighted two major issues regarding the lack of likelihood to attend, financial reasons and lack of outreach. Copley and Douthett (2020) referenced the enrollment cliff and stated the decline is not influenced by the rising costs of a college education or the declining image of the value of a college degree. The decline is beyond the control of higher education institutions. Copley and Douthett indicated the nation's fertility rate as the main cause of the decline. Not only were fertility rates decreasing, but immigrant rates, as well as international student attendance rates were also down. Copley and

Douthett also discussed in addition to declining enrollment, colleges were also struggling with increasing tuition rates. Copley and Douthett stated that if institutions were to continue to raise tuition rates this would also negatively impact enrollment rates.

The purpose of my descriptive, quantitative study was to explore the matriculation rates for first-time, full-time freshmen at the 13 public, community colleges in Tennessee who were previously enrolled in dual enrollment courses while in high school. During my study, I reviewed the data collected by the TBR regarding previously enrolled dual enrollment students and the rate at which they continued their enrollment at the institution where they received their dual enrollment credits. During my study demographic variables of gender, race, number of credits earned from dual enrollment, grade point average during dual enrollment, and ACT scores were analyzed. Data showed institutional dual enrollment compared to other Tennessee Board of Regents community colleges. It is important to note that Tennessee College of Applied Technology data were not included in my study.

Research Questions

The following research questions were addressed to assess various demographic data involving former dual enrollment students and the matriculation rates at the 13 Tennessee Board of Regents community colleges. The following demographic variables addressed were: gender, race, number of dual enrollment courses students competed, grade point averages before and after dual enrollment courses, ACT scores, first-generation status, and students who used Tennessee Promise funds. The following seven research questions were addressed.

Research Question 1. What is the total number of dual enrollment students for each of Tennessee's community colleges during the study years (2016-2021)?

Research Question 2. After graduating high school, what percent of dual enrollment students matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021)?

Research Question 3. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) by gender (male or female)?

Research Question 4. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) by race (Black, Hispanic, White, or other)?

Research Question 5. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on the total number of dual enrollment credits earned?

Research Question 6. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on GPA for dual enrollment courses?

Research Question 7. After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on ACT scores?

Data Source

Enrollment data were provided from the Tennessee Board of Regents (TBR) database. For my study, the data provided were collected from the following institutions: Chattanooga State Community College, Cleveland State Community College, Columbia State Community College, Dyersburg State Community College, Jackson State Community College, Motlow State Community College, Nashville State Community College, Northeast State Community College, Pellissippi State Community College, Roane State Community College, Southwest State Community College, Volunteer State Community College, and Walters State Community College. The TBR community colleges use Banner software as their student information system. Each community college kept student data through a version of Banner specific to that institution. Ellucian Banner is a major student information system used in higher education systems across the nation.

Population

The population of this descriptive, quantitative study consisted of more than 146,000 students who had previously completed dual enrollment courses at one of the 13 Tennessee Board of Regents community colleges from Fall of 2016 to Spring 2021. Each of the community colleges served a geographically based service area that typically consisted of at least two or more counties and two or more sites. The stated vision of the TBR is for, "A Tennessee population and workforce with the knowledge and skills to be competitive in the world economy" (TBR, n.d., para. 4). The TBR also aims to "Raise the education and skill levels in Tennessee through quality programs and services, efficiently delivered" (TBR, n.d., para. 4). My study was designed to provide insight into the participation of dual enrollment students at the 13 TBR community colleges and the rates that these students matriculated to

the same institution where they participated in dual enrollment. Students were selected for this study based on their participation in at least one dual enrollment course at one of the TBR institutions. In a 2019 TBR study of dual enrollment students, enrollments totaled 16,519 students. However, in 2021, 15,403 students enrolled in dual enrollment courses at a Tennessee community college. My study includes students who enrolled in dual enrollment from 2016 to 2021.

Data Collection

Data for my descriptive, quantitative study were provided through the TBR. The TBR stored the data through a secure database. Each of the community colleges had their own individual version of the software program, Banner, specific to their institution. Before I was provided with the appropriate student data, I completed the Institutional Review Board (IRB) request from East Tennessee State University. After the IRB forms were approved, I requested the data from the Tennessee Board of Regents. The TBR's Office of Policy and Strategy provided student-level anonymized data. The TBR requires researchers to provide a brief abstract of the project for the TBR to review. After the abstract had been reviewed by a member of the TBR, a staff member reached out to arrange a virtual meeting to discuss the data needed for the research. That staff member then was required to receive permission from TBR leadership to fulfill the data request. After approval by TBR leadership, I was provided with a list of available data fields that could be requested and was asked to select the format and content of the requested dataset. The TBR then prepared the anonymized student-level dataset with a codebook for understanding data fields. The dataset and codebook were then created, and the TBR then shared the materials through a secure, file-sharing channel.

Data Analysis

The data collected for this study were analyzed through descriptive methods (means, standard deviations, ranges, proportions, and percentages). Due to the nature of a descriptive, quantitative study, the goal was to systematically describe the data or phenomena occurring. For my study, the data provided revolved around matriculation rates of students taking dual enrollment at TBR community colleges. Because the TBR possessed data regarding each community college's matriculation rates, means, standard deviations, and ranges, it seemed appropriate to describe the general matriculation rates of dual enrollment students throughout the TBR community college system. Each of the 13 community colleges data were analyzed separately.

- Means - Means were implemented into each research question in this study. The means would provide insight into overall averages of matriculations based on demographics, such as gender, race, or number of courses.
- Standard deviations - Standard deviations were also implemented into each research question in the study. The standard deviation in statistics provided the dispersion of data to the mean. This provided information on how institutions vary in matriculation rates in relation to means.
- Ranges - Ranges were not stated in the research questions but were implemented into the presentation of data. Providing ranges allowed TBR institutions to be labeled from highest and lowest by matriculation rates based on various demographics.
- Percentages - Percentages were used in my study to show rates to the hundredths. Providing percentages will allow matriculation rates to be examined between 0% and 100%.

- Proportions - Proportions were also used in my study to express the relation of two ratios.

Chapter Summary

Chapter 3 contained an overview of the research method used in my study. This chapter began with an introduction to the study and the importance and relevance of the study in the world of higher education. The research questions were also presented. The research questions were related to the matriculation rates of institutions based on various demographics, such as gender, race, number of classes taken, grade point average prior to dual enrollment classes, grade point average during dual enrollment, ACT scores, first-generation students, and students who used Tennessee Promise funds. The data that were used in my study was archival data that was obtained from the Tennessee Board of Regents Office of Data and Research. Data were provided regarding the matriculation rates of high school students who participated in dual enrollment courses at a TBR community college from 2016 to 2021. Because of the nature of quantitative research with a descriptive design the data analyses were accomplished through means, standard deviations, ranges, proportions, and percentages.

Chapter 4. Results

The purpose of this descriptive, quantitative study was to explore the matriculation rates for first-time, full-time freshmen at the 13 public, community colleges in Tennessee who were previously enrolled in dual enrollment courses while in high school. Percentages, means, standard deviations, ranges, percentages, and proportions were used to describe the data from the 13 community colleges. Other variables, such as gender, race, number of classes taken, grade point average prior to dual enrollment classes, grade point average during dual enrollment, as well as ACT scores were also reported. Findings will allow institutions within the Tennessee Board of Regents to assess their dual enrollment matriculation rates and reported demographics. For the purpose of this study, only students whose first and last term of dual enrollment both occurred between fall 2016 to spring 2021 were used. Data from each of the 13 Tennessee community colleges data were analyzed separately for the five-year study period. This chapter provides descriptive data to answer each of the eight research questions.

Research Question 1

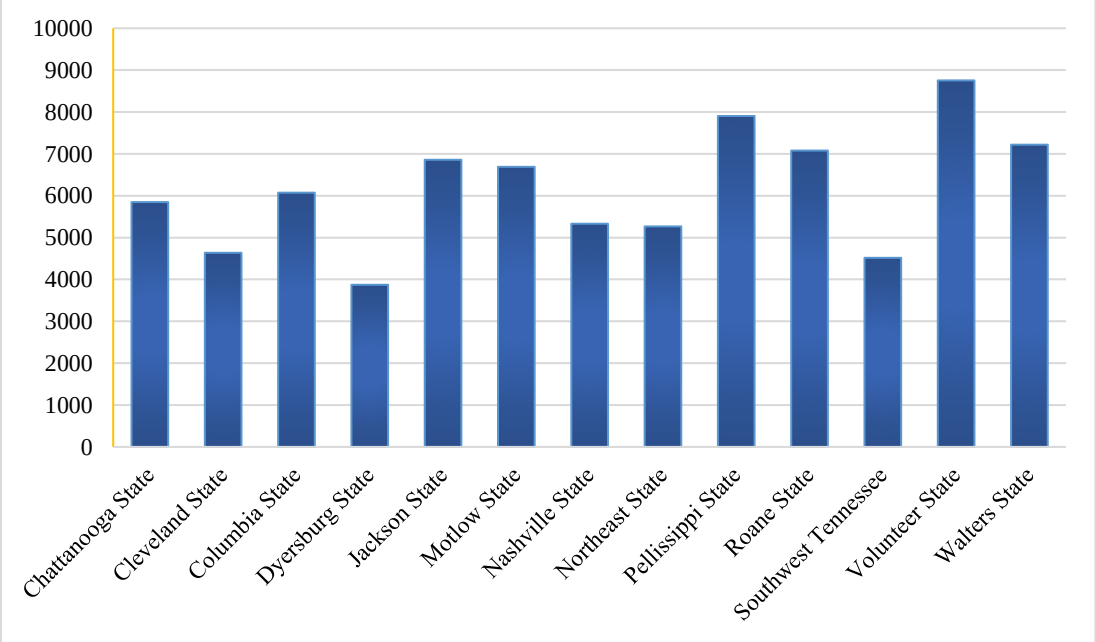
What is the total number of dual enrollment students for each of Tennessee's community colleges during the study years (2016-2021)?

Data from the TBR were analyzed to determine the total number of dual enrollment students enrolled at each of the TBR community colleges from fall 2016 to spring 2021. The data show; Chattanooga State Community College (5,848), Cleveland State Community College (4,637), Columbia State Community College (6,073), Dyersburg State Community College (3,873), Jackson State Community College (6,859), Motlow State Community College (6,690), Nashville State Community College (5,331), Northeast State Community College (5,267), Pellissippi State Community College (7,904), Roane State Community College (7,079),

Southwest Tennessee Community College (4,517), Volunteer State Community College (8,754), and Walters State Community College (7,219). The total number of students who were enrolled in dual enrollment classes across the 13 community colleges over the period was 80,051. Of the 80,051 students, 16,727 students matriculated at their host community college and 63,324 did not. The mean enrollment was 6,157 with a standard deviation of 1,368. The range of the enrollments provided displayed Dyersburg State Community College (3,873) at the lowest dual enrollment during the period and Volunteer State Community College (8,754) at the highest dual enrollment during the period (see Figure 1).

Figure 1

Total Dual Enrollment Participation Fall 2016 – Spring 2021



Research Question 2

After graduating high school, what percent of dual enrollment students matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021)?

The data received from the TBR recorded students' matriculation rates based on whether students attended the same institution for an associate's degree in which they participated in dual enrollment. This was also referred to as a home institution. The data show the matriculation percentages as follows; Chattanooga State Community College (20.43%), Cleveland State Community College (23.42%), Columbia State Community College (19.66%), Dyersburg State Community College (20.11%), Jackson State Community College (16.96%), Motlow State Community College (21.79%), Nashville State Community College (8.59%), Northeast State Community College (26.39%), Pellissippi State Community College (20.77%), Roane State Community College (27.08%), Southwest Tennessee Community College (12.04%), Volunteer State Community College (19.51%), and Walters State Community College (30.38%). The total matriculation of the 13 community colleges over the period was 16,727 matriculated to their home institution out of 80,051. The mean matriculation percentage was 20.90% or approximately 1,286 students with a ratio of 1:4. The range of the enrollments showed Nashville State Community College (8.59%) at the lowest matriculation during the period and Walters State Community College (30.38%) at the highest matriculation during the time period (see Table 1).

Table 1

Matriculation Percentages of Dual Enrollment Students by Institution

College	Matriculated	Did Not Matriculate	Matriculation %
Chattanooga State	1195	4653	20.43
Cleveland State	1086	3551	23.42
Columbia State	1194	4879	19.66
Dyersburg State	779	3094	20.11
Jackson State	1163	5696	16.96
Motlow State	1458	5232	21.79
Nashville State	458	4873	8.59
Northeast State	1390	3877	26.39
Pellissippi State	1642	6262	20.77
Roane State	1917	5162	27.08
Southwest Tennessee	544	3973	12.04
Volunteer State	1708	7046	19.51
Walters State	2193	5026	30.38
	16727	63324	20.90

Research Question 3

After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) by gender (male or female)?

The data from the TBR revealed 16,727 students who matriculated at their home institution from 2016-2021. For the students who matriculated to their home institution after graduating high school, 6,230 students were male to 10,494 students were female. Males accounted for 36.77% of the matriculation rates while females accounted for 63.20% of the matriculation rates. Across the 13 community colleges, females accounted for a ratio of approximately 5:3 compared to males. The range of the matriculation rates showed: Dyersburg

State Community College (29.01% males / 70.98% females) as the largest discrepancy for matriculation by gender during the time period and Pellissippi State Community College (44.15% males / 55.84% females) as the lowest discrepancy for matriculation by gender during the time period.

For the 63,324 students who did not matriculate to their home institution after graduating high school, 25,134 students were male and 38,175 students were female. Males accounted for 39.83% of the non-matriculation numbers and females accounted for 60.14% of the non-matriculation numbers. Across the 13 community colleges, females accounted for a ratio of approximately 3:2 compared to males. The range of the matriculation rates provided displayed Roane State Community College (37.07% males / 62.92% females) as the largest discrepancy for non-matriculation by gender during the time period and Northeast State Community College (44.82% males / 55.17% females) as the lowest discrepancy for matriculation by gender during the time period. Eighteen students did not report a gender. Overall, males numbered less than females in matriculation and non-matriculation to home institutions (see Table 2).

Table 2

Matriculation Percentage at Home Institution by Gender

	Matriculated			Did Not Matriculate		
College	Total	Male	Female	Total	Male	Female
Chattanooga State	1195	506	689	4653	1855	2798
Cleveland State	1086	476	610	3551	1418	2133
Columbia State	1194	483	708	4879	1952	2918
Dyersburg State	779	226	553	3094	1257	1837
Jackson State	1163	375	788	5696	2240	3452
Motlow State	1458	491	967	5232	2066	3166
Nashville State	458	150	308	4873	1892	2979
Northeast State	1390	586	804	3877	1738	2139
Pellissippi State	1642	725	917	6262	2552	3710
Roane State	1917	632	1285	5162	1914	3248
Southwest Tennessee	544	72	372	3973	1567	2406
Volunteer State	1708	670	1038	7046	2718	4328
Walters State	2193	738	1455	5026	1965	3061
	16727	**6230**	**10494**	**63324**	**25134**	**38175**

Research Question 4

After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) by race (Black, Hispanic, White, or other)?

The data included a total of 16,727 students who matriculated at their home institution from 2016-2021. For the students who matriculated to their home institution after graduating high school, 13,935 students were White (83.3%), 1,023 were Black (6.1%), 738 were Hispanic (4.4%), 447 were Multiracial (2.6%), 140 were Asian (0.8%)**,** 27 were Native American (0.16%), 13 were Native Hawaiian (0.07%), and 404 were unclassified (2.41%). The mean matriculation

rates at all Tennessee community colleges were as follows: White (27.24%), Black (19.19%), Hispanic (26.92%), 447 were Multiracial (23.84%), 140 were Asian (10.59%)**,** Native American (21.44%), and 13 were Native Hawaiian (27.93%). 404 students were unclassified and matriculated at a mean of 18.06%.

Across the 13 community colleges, White students matriculated at a ratio of nearly 6:1 compared to other groups combined. The range of the matriculation rates were: Walters State Community College (45.34%) as the highest for matriculation by White students and Nashville State Community College (10.03%) as the lowest for matriculation by White students. Roane State Community College (16.39%) was the highest for matriculation by Asian students and Northeast State Community College (5.00%) was the lowest for matriculation by Asian students. Northeast State Community College (37.77%) was the highest for matriculation by Black students, and Nashville State Community College (8.10%) was the lowest for matriculation by Black students. Cleveland State Community College (42.72%) was the highest for matriculation by Hispanic students and Nashville State Community College (10.64%) was the lowest for matriculation by Hispanic students. Pellissippi State Community College (33.17%) was the highest for matriculation by Multiracial students and Nashville State Community College (6.99%) was the lowest for matriculation by Multiracial students. Jackson State Community College (75.00%) was the highest for matriculation by Native American students and Southwest Tennessee Community College (0%) was the lowest for matriculation by Native American students. Native Hawaiian and Native Alaskan students were also represented, but due to lower numbers, multiple institutions did not matriculate students from these groups.

Table 3

Matriculation Percentage at Home Institution by Race

College	Total	Asian	Black	Hispanic	Multiracial	Native American	White
Chattanooga State	1195	9.37	21.71	34.03	23.90	11.11	26.53
Cleveland State	1086	12.90	21.37	42.72	23.91	40.00	30.77
Columbia State	1194	9.79	27.45	34.67	26.82	10.00	24.45
Dyersburg State	779	14.81	22.81	23.15	21.69	18.75	25.76
Jackson State	1163	13.48	19.74	22.45	19.48	75.00	20.42
Motlow State	1458	8.87	14.28	26.63	23.12	14.28	30.20
Nashville State	458	5.88	8.10	10.64	6.99	11.76	10.03
Northeast State	1390	5.00	37.77	29.72	26.35	13.33	37.08
Pellissippi State	1642	7.72	15.98	26.94	33.17	14.28	27.09
Roane State	1917	16.39	11.01	25.56	23.17	8.33	39.82
Southwest Tennessee	544	6.25	14.18	14.54	17.94	0.00	11.76
Volunteer State	1708	13.63	17.08	24.16	30.36	28.57	24.92
Walters State	2193	13.63	18.03	34.80	33.07	33.33	45.34
Totals	**16727**	**10.59**	**19.19**	**26.92**	**23.84**	**21.44**	**27.24**

Research Question 5

After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on the total number of dual enrollment credits earned?

The data included a total of 16,727 students who matriculated at their home institution from 2016-2021. Out of the students who matriculated to their home institution after graduating high school, 9,215 (28.74%) students earned 1 to 6 credits, 4,095 (25.51%) students earned 7 to 12 credits, 1,419 (23.35%) students earned 13 to 18 credits, 548 (23.18%) students earned

somewhere between 19-24 credits, and 570 (19.39%) students earned 25 credits or more credits. A total of 880 (24.89%) students registered for courses but did not earn credit.

Across the 13 community colleges, the range of the matriculation rates were: Walters State Community College (44.56%) as the highest for matriculation by students earning 1-6 dual enrollment credits and Nashville State Community College (9.46%) as the lowest for matriculation by students earning 1-6 dual enrollment credits. Walters State Community College (47.64%) was the highest for matriculation by students earning 7-12 dual enrollment credits and Nashville State Community College (8.78%) was the lowest for matriculation by students earning 7-12 dual enrollment credits. Walters State Community College (46.15%) was the highest for matriculation by students earning 13-18 dual enrollment credits and Nashville State Community College (9.25%) was the lowest for matriculation by students earning 13-18 dual enrollment credits. Northeast State Community College (52.33%) was the highest for matriculation by students earning 19-24 dual enrollment credits and Volunteer State Community College (8.63%) was the lowest for matriculation by students earning 19-24 dual enrollment credits. Northeast State Community College (65.26%) was the highest for matriculation by students earning more than 25 dual enrollment credits and Dyersburg State Community College (4.20%) was the lowest for matriculation by students earning more than 25 dual enrollment credits. Northeast State Community College (42.60%) was the highest for matriculation by students who did not complete and earn a dual enrollment credit and Nashville State Community College (10.84%) was the lowest for matriculation by students who did not complete and earn a dual enrollment credit.

Table 4

Matriculation Percentage at Home Institution by Dual Enrollment Credits Earned

College	Total	1-6 Credits	7-12 Credits	13-18 Credits	19-24 Credits	25 or More Credits
Chattanooga State	1195	25.49	23.84	19.38	19.04	23.43
Cleveland State	1086	35.47	30.59	23.22	19.30	12.05
Columbia State	1194	24.30	25.36	20.21	35.59	14.66
Dyersburg State	779	34.98	19.87	15.67	14.66	4.20
Jackson State	1163	21.13	20.73	20.58	17.19	18.22
Motlow State	1458	31.83	30.61	29.57	21.05	12.23
Nashville State	458	9.46	8.78	9.25	10.00	9.23
Northeast State	1390	37.19	27.73	29.16	52.33	65.26
Pellissippi State	1642	28.59	18.50	22.07	22.02	30.41
Roane State	1917	39.41	38.39	40.32	32.44	10.23
Southwest Tennessee	544	13.88	14.24	9.43	12.12	9.09
Volunteer State	1708	27.34	25.40	18.49	8.63	14.89
Walters State	2193	44.56	47.64	46.15	37.01	28.23
	16727	**28.74**	**25.51**	**23.35**	**23.18**	**19.39**

Research Question 6

After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on GPA for dual enrollment courses?

The archival included a total of 16,727 students who matriculated at their home institution from 2016-2021. Of the students who matriculated to their home institution after graduating high school, 1,734 (21.17%) students earned below a 2.0 GPA. 1,588 (24.63%) students earned between a 2.0 and 2.49 GPA. 1,178 (23.62%) students earned between a 2.50

and 2.99 GPA. 4,010 (23.89%) students earned between a 3.0 and 3.49 GPA. 8,217 (18.31%) students earned between a 3.50 and 4.0 GPA.

Across the 13 community colleges, the range of the matriculation rates were: Northeast State Community College (30.12%) as the highest for matriculation by students earning less than a 2.0 high school GPA and Southwest Tennessee Community College (10.41%) as the lowest for matriculation by students earning less than a 2.0 high school GPA. Northeast State Community College (33.06%) was the highest for matriculation by students earning between a 2.0 and 2.49 high school GPA and Nashville State Community College (12.16%) was the lowest for matriculation by students earning between a 2.0 and 2.49 high school GPA. Walters State Community College (34.51%) was the highest for matriculation by students earning between a 2.50 and 2.99 high school GPA and Southwest Tennessee Community College (10.88%) was the lowest for matriculation by students earning between a 2.50 and 2.99 high school GPA. Walters State Community College (35.93%) was the highest for matriculation by students earning between a 3.0 and 2.49 high school GPA and Nashville State Community College (9.58%) was the lowest for matriculation by students earning between a 3.0 and 3.49 high school GPA. Roane State Community College (28.47%) was the highest for matriculation by students earning between a 3.50 and 4.0 high school GPA and Nashville State Community College (6.87%) was the lowest for matriculation by students earning between a 3.50 and 4.0 high school GPA.

Table 5

Matriculation Percentage at Home Institution by GPA

	Matriculations by GPA					
College	Total	Below 2.0	2.0 - 2.49	2.50 - 2.99	3.0 - 3.49	3.50 - 4.0
Chattanooga State	1195	26.29	28.57	22.62	24.76	15.56
Cleveland State	1086	20.96	27.08	24.83	29.44	21.43
Columbia State	1194	22.99	28.62	20.86	22.35	16.66
Dyersburg State	779	25.18	20.17	21.39	21.16	19.09
Jackson State	1163	17.39	20.06	19.57	20.17	14.68
Motlow State	1458	19.06	25.46	25.87	26.62	19.35
Nashville State	458	11.01	12.16	14.23	9.58	6.87
Northeast State	1390	30.12	33.06	33.60	30.80	22.67
Pellissippi State	1642	25.96	29.75	26.50	23.26	16.77
Roane State	1917	19.81	25.04	29.70	27.33	28.47
Southwest Tennessee	544	10.41	12.52	10.88	15.62	11.28
Volunteer State	1708	20.83	25.29	22.44	23.54	16.91
Walters State	2193	25.21	32.46	34.51	35.93	28.25
	16727	21.17	24.63	23.62	23.89	18.31

Research Question 7

After graduating high school, is there a difference in the percent of dual enrollment students who matriculated at the community college offering their dual enrollment courses for each of Tennessee's community colleges during the study years (2016-2021) based on ACT scores?

The data from the TBR revealed 16,727 students who matriculated at their home institution from 2016-2021. Of the students who matriculated to their home institution after graduating high school, 395 students had below a 15 ACT score, 3,935 students had scores between 16 to 20, 6,096 students had scores between 21 to 25, 1,406 students had scores between 26 to 30, and 94 students had scores between 31 to 36. 4,801 did not have scores reported.

Across the 13 community colleges, the range of the matriculation rates showed: Nashville State Community College (23.18%) had the lowest number of students matriculating with an ACT score below 15. Northeast State Community College (45.18%) was the highest for matriculation by students with an ACT score between 16 to 20. Walters State Community College (37.00%) was the highest for matriculation by students with an ACT score between 21 to 25. Walters State Community College (17.98%) was the highest for matriculation by students with an ACT score between 26 to 30. Volunteer State Community College (6.36%) was the highest for matriculation by students with an ACT score between 31 to 36. See Table 7 for mean ACT scores by each institution.

Table 6

Matriculation Percentage at Home Institution by ACT Scores

College	Total	Below 15	16 - 20	21 - 25	26 - 30	31 - 36
Chattanooga State	1195	37.68	34.26	21.92	9.70	3.42
Cleveland State	1086	38.75	30.53	24.48	16.52	4.04
Columbia State	1194	25.00	39.05	22.94	10.10	1.90
Dyersburg State	779	34.88	36.17	20.28	9.12	4.46
Jackson State	1163	34.28	26.41	21.15	8.64	2.61
Motlow State	1458	36.58	39.03	28.47	14.84	4.63
Nashville State	458	23.18	13.03	10.00	5.36	2.66
Northeast State	1390	37.75	45.18	27.22	12.71	1.81
Pellissippi State	1642	41.37	38.56	25.89	11.38	1.93
Roane State	1917	39.73	39.40	30.71	17.05	5.35
Southwest Tennessee	544	25.00	17.32	10.45	3.70	0.00
Volunteer State	1708	52.94	29.23	23.48	11.69	6.36
Walters State	2193	45.71	45.04	37.00	17.98	3.27
	16727	**36.37**	**33.32**	**23.38**	**11.45**	**3.26**

Table 7

Mean ACT Scores by Institution

College	Total	Matriculated	Did Not Matriculate
Chattanooga State	23.07	21.38	23.56
Cleveland State	22.52	21.50	22.88
Columbia State	24.32	22.04	24.90
Dyersburg State	23.51	21.64	23.99
Jackson State	22.61	21.23	22.97
Motlow State	23.09	21.60	23.65
Nashville State	23.00	21.47	23.17
Northeast State	23.27	21.50	24.06
Pellissippi State	24.71	22.62	25.27
Roane State	22.50	21.30	23.02
Southwest Tennessee	19.08	16.95	19.53
Volunteer State	23.86	22.52	24.23
Walters State	23.55	21.98	24.31
	23.31	21.68	23.79

Chapter Summary

Chapter 4 presented the research questions, as well as the data presented in tables displaying matriculation rates by percentage. Each research question displayed a different variable regarding matriculation. Each of the 13 institutions was reviewed for individual matriculation percentage by variable. Data were analyzed descriptively and included means, ranges, ratios, and percentages. In Chapter 5, the findings will be presented and conclusions will be drawn. Individual conclusions by institutions will be provided as well as recommendations for practice and further research will be included.

Chapter 5. Summary, Conclusions, and Recommendations

The purpose of my descriptive, quantitative study was to explore the matriculation rates for first-time, full-time freshmen at the 13 public community colleges in Tennessee who were previously enrolled in dual enrollment courses while in high school. Percentages, means, standard deviations, ranges, percentages, and proportions were used to describe the administrative data from the 13 public community colleges in Tennessee. Other variables such as gender, race, number of credits earned, GPA during dual enrollment, and ACT scores were also reported.

The study's findings will allow for institutions within the Tennessee Board of Regents to be compared based on matriculation rates and various demographics. Each of the 13 Tennessee community colleges' data were analyzed separately for a five-year period. This study stemmed from previous studies, such as Fink et al., (2017) which discussed the lack of matriculation of dual enrollment students to community colleges. In the study from Fink et al., the researchers discovered that 84% of students ended up enrolling at the community college where they first participated in dual enrollment. In Tennessee, 57% of former dual enrollment students enrolled at four-year institutions as opposed to community colleges. Tennessee falls into the bottom 15% of the country in former dual enrollment students attending community colleges (Fink et al., 2017).

Summary

My study contained seven research questions that addressed various variables for dual enrollment participants. I analyzed the total number of dual enrollment students for each of Tennessee's community colleges during the study years (2016-2021). The total number of students who participated in dual enrollment across the 13 community colleges over the period

totaled 80,051. The mean enrollment was approximately 6,157 with a standard deviation of approximately 1,368. The range of the enrollments provided displayed Dyersburg State Community College (3,873) at the lowest dual enrollment during the period and Volunteer State Community College (8,754) at the highest dual enrollment during the period.

The percentage of dual enrollment students who matriculated at their home institution for each of Tennessee's community colleges during the study years (2016-2021) was also investigated. The total matriculation of the 13 community colleges over the period totaled 16,727 matriculated to their home institution out of 80,051. The mean matriculation percentage was 20.90% or approximately 1,286 students with a ratio of equating to nearly 1:4. The range of the enrollments provided displayed Nashville State Community College (8.59%) at the lowest matriculation during the period and Walters State Community College (30.38%) at the highest matriculation during the period.

The percent of dual enrollment students who matriculated at their home institution for each of Tennessee's community colleges during the study years (2016-2021) by gender (male or female) was evaluated. The archival data from the TBR revealed 16,727 students who matriculated at their home institution from 2016 to 2021. For the students who matriculated to their home institution after graduating high school, 6,230 students were male and 10,494 students were female. Males accounted for 36.77% of the matriculation rates while females accounted for 63.20% of the matriculation rates. Across the 13 community colleges, females accounted for an enrollment ratio of approximately 3:5 compared to males. The range of the matriculation rates provided displayed Dyersburg State Community College (29.01% males / 70.98% females) as the largest discrepancy for matriculation by gender during the period and Pellissippi State

Community College (44.15% males / 55.84% females) as the lowest discrepancy for matriculation by gender during the period.

The percentage of dual enrollment students who matriculated at their home institution for each of Tennessee's community colleges during the study years (2016-2021) by race (Black, Hispanic, White, or other) was also studied. The archival data included a total of 16,727 students who matriculated at their home institution from 2016-2021. Of the students who matriculated to their home institution after graduating high school, 13,935 students were White (83.3%), 1,023 were Black, Not Hispanic (6.1%), 738 were Hispanic (4.4%), 447 were Multiracial (2.6%), 140 were Asian (0.8%)**,** 27 were Native American (0.16%), 13 were Native Hawaiian (0.07%), and 404 were unclassified (2.41%). The mean matriculation rates were as follows: White (27.24%), Black, Not Hispanic (19.19%), Hispanic (26.92%), 447 were Multiracial (23.84%), 140 were Asian (10.59%)**,** Native American (21.44%), and 13 were Native Hawaiian (27.93%). 404 students were unclassified and matriculated at a mean of 18.06%.

The percent of dual enrollment students who matriculated at their home institution for each of Tennessee's community colleges during the study years (2016-2021) was analyzed based on the total number of dual enrollment credits earned. The archival data included a total of 16,727 students who matriculated at their home institution from 2016-2021. Out of the students who matriculated to their home institution after graduating high school, 9,215 (28.74%) students earned somewhere between 1-6 credits, 4,095 (25.51%) students earned somewhere between 7-12 credits, 1,419 (23.35%) students earned somewhere between 13-18 credits, 548 (23.18%) students earned somewhere between 19-24 credits, and 570 (19.39%) students earned 25 credits or more. A total of 880 (24.89%) students attempted credits but did not earn credit.

The percent of dual enrollment students who matriculated at their home institution for each of Tennessee's community colleges during the study years (2016-2021) was studied based on GPA for dual enrollment courses. The archival data included a total of 16,727 students who matriculated at their home institution from 2016-2021. Of the students who matriculated to their home institution after graduating high school, 1,734 (21.17%) students earned below a 2.0 GPA. 1,588 (24.63%) students earned between a 2.0 and 2.49 GPA. 1,178 (23.62%) students earned between a 2.50 and 2.99 GPA. 4,010 (23.89%) students earned between a 3.0 and 3.49 GPA. 8,217 (18.31%) students earned between a 3.50 and 4.0 GPA.

The percent of dual enrollment students who matriculated at their home institution for each of Tennessee's community colleges during the study years (2016-2021) was evaluated based on ACT scores (less than 21 or 21 and above). The archival data from the TBR revealed 16,727 students who matriculated at their home institution from 2016 to 2021. Of the students who matriculated to their home institution after graduating high school, 395 students had below a 15 ACT score, 3,935 students had scores between 16 to 20, 6,096 students had scores between 21 to 25, 1,406 students had scores between 26 to 30, and 94 students had scores between 31 to 36. 4,801 did not have scores reported.

Discussion

Throughout this study, there were consistencies between the TBR institutions as well as inconsistencies regarding demographics. For instance, Nashville State Community College and Southwest Tennessee College were consistently near the bottom in matriculation rates. My study demonstrated support for previous studies, such as Fink et al. (2017), who discovered that more than one-half of dual enrollment students who move on to attend college attend a community college. Of the studied group, 84% of students ended up enrolling at the community college

where they first participated in dual enrollment. She found that in Tennessee, 57% of former dual enrollment students ended up enrolling at four-year institutions as opposed to community colleges. Table 1 shows the average matriculation rate of dual enrollment students was 26.41%. Over the 5-year period from 2016 to 2021, 76.21% of students did not matriculate to their home institution. This number supports Fink et al. claim that Tennessee falls into the bottom 15% of the country in former dual enrollment students attending community colleges. While there were very few studies that mirrored my study, there were a couple of studies that could lead to further discussions. Wilson (2019) reviewed whether there was a relationship between the number of hours obtained through dual credit and the matriculation rates at West Kentucky Community and Technical College. Wilson also studied the relationship between the high school's distance to WKCTC and matriculation rates. In Wilson's study, it was discovered that students who participated in dual enrollment from a high school 10 miles or less away (49.1%), as well as from 11-30 miles away (42.3%) from WKCTC were more likely to matriculate than those from a school outside of 30 miles (8.6%). This data could be beneficial for the TBR in the future. Other studies supported by my study included the NCES (2022) which studied the gender gap in higher education. The study stated that the 6-year graduation rate in 2014 was higher for females (67%) than for males (60%). At private nonprofit institutions, the 6-year graduation gap is the largest at 71% of females and 64% of males. In my study, it was demonstrated that males accounted for 36.77% of the matriculation rates while females accounted for 63.20% of the matriculation rates. Across the 13 community colleges, females accounted for a ratio of approximately 5:3 compared to males. In relation to racial gaps, Banks and Tester (2019), determined that the six-year completion rates at four-year institutions show that African American students were the least likely to graduate at 45.9%, with Hispanic students following next at 55%, and White students

averaged a graduation rate of 67.2%. This is consistent with my study of the racial gap of students who matriculate. White students matriculated at an average of 27.24% while Black students matriculated at a rate of 19.19% and Hispanic students at 26.92%. While the gap between White and Hispanic students is not as large, the 8.05% difference between White and Black students demonstrates a clear gap. Further qualitative studies could be done to support Poliakoff (2022) who studied the effects of faculty diversity on Black student-athlete graduation rates. Poliakoff found that some Division I institutions demonstrated more than a 30% gap between Black student-athlete graduation rates compared to non-Black student-athletes. Poliakoff discovered that there was a significant positive impact on Black student graduation rates with an increase in the percentage of Black faculty members. Studies should be conducted on each TBR institution to analyze the diversity of the faculty compared to the percentage of matriculation of students of color. Recommendations for practice for each of the 13 TBR institutions are detailed below:

Chattanooga State Community College ranked 8th in dual enrollment participation and 7th in matriculation rates. Across the various categories, Chattanooga State ranked slightly below average. Chattanooga State saw its greatest strengths in the matriculation of Hispanic students (4^{th}), matriculation of male students, matriculation of students with 25 or more earned credits, and matriculation of students below an ACT score of 15. The greatest areas of improvement for Chattanooga State include the matriculation of female students and matriculation of students with a GPA between 3.50 – 4.0. Overall, Chattanooga State falls near the mean in a majority of these categories.

Cleveland State Community College ranked 11th in dual enrollment participation and 4th in matriculation rates. Cleveland State saw its greatest strengths in its matriculation of male

students, matriculation of students with an ACT score between 36 – 30 (3rd), matriculation of students earning 12 or fewer credits, and matriculation of Hispanic students (1st). Cleveland State's greatest areas of improvement include their matriculation of female students and their matriculation of students earning more than 19 credits. Overall, Cleveland State falls above the mean in most areas, and in the areas in which they are below they are slightly below.

Columbia State Community College ranked 7th in dual enrollment participation and 9th in matriculation rates. Columbia State's greatest strengths were found in their matriculation of male students, matriculation of Black, Not Hispanic students (2nd), matriculation of Hispanic students (3rd), and matriculation of students with 19 – 24 credits earned. Columbia State's greatest areas for improvement include their matriculation of female students, matriculation of students earning more than 25 credits, and students with ACT scores below 15.

Dyersburg State Community College ranked 13th in dual enrollment participation and 8th in matriculation rates. Dyersburg State's greatest strengths fell in their matriculation of female students, matriculation of students with 1 – 6 credits earned, and matriculation of students with an ACT score between 31 – 36 (4th). Dyersburg State's greatest areas of improvement include the matriculation of students earning 13 or more credits and the matriculation of students with GPAs between 2.0 and 2.99. Dyersburg State also saw the largest discrepancy in matriculation between males and females at over 40 percent.

Jackson State Community College ranked 5th in dual enrollment participation and 11th in matriculation rates. Jackson State ranked slightly below the mean in most areas. They showed their greatest strengths in matriculation among female students, Hispanic students, and Asian students. Jackson State showed the most need for improvement in the matriculation of male students, students earning 12 credits or less, and students with ACT scores between 16 and 20.

Regarding matriculation by GPA, Jackson State was consistently around three to four percent below the mean.

Motlow State Community College ranked 6th in dual enrollment participation and 5th in matriculation rates. Motlow State fell slightly above average in a majority of areas. Motlow State showed their greatest strengths in matriculation of female students, matriculation of students between 1 and 18 earned credits, and matriculation of students with GPAs between 2.50 and 3.49. Motlow State saw the largest room for improvement in matriculation of male students, matriculation of Black, Not Hispanic students, and matriculation of students with 25 or more earned credits.

Nashville State Community College ranked 9th in dual enrollment participation and 13th in matriculation rates. Nashville State ranked below average in all but one area, the matriculation of female students. Nashville State showed the greatest strengths in their matriculation of female students as well as their matriculation of students with an ACT score over 31 in which they were barely below average. The greatest areas for improvement for Nashville State include the matriculation of black students (13^{th}), Hispanic students (13^{th}), matriculation of male students, and matriculation of students earning less than 18 credits. Further research should be conducted to better examine potential causes of consistently lower matriculation rates at Nashville State.

Northeast State Community College ranked 10th in total dual enrollment participation and ranked 3rd in matriculation rates. Northeast State ranked above average in most areas related to matriculation. Northeast State showed the greatest strengths in their matriculation of Black, Not Hispanic students (1^{st}) and the matriculation of students with GPAs below 2.0 and 2.0 – 2.49 (1^{st}). Areas for improvement for Northeast State include the matriculation of Asian students, the matriculation of female students, and the matriculation of students with ACT scores of 31 – 36.

Pellissippi State Community College ranked 2nd in dual enrollment participation and 6th in matriculation. Pellissippi State's greatest strengths fell in matriculation of males, Multiracial students (1st), students with 25 or more credits earned (2nd), and students who did not earn any credits (2nd). Pellissippi State's greatest room for improvement came in the matriculation of females, matriculation of Asian and Black, Not Hispanic students, students who earned between 7 and 12 credits, and students with ACT scores between 31 and 36.

Roane State Community College ranked 4th in dual enrollment participation and 2nd in matriculation. Roane State ranked among the top in multiple areas and showed greatest strengths in the following areas: matriculation of female students, matriculation of Asian students (1st), matriculation of students earning between 1 and 18 credits (2nd in all), matriculation of students with GPAs above 3.50, and matriculation of students with an ACT score between 31 and 36. Roane State showed high numbers in the matriculations of higher academic achieving students, which is not the case for most other institutions. Roane State showed the largest room for improvement in the matriculations of males, Black, Not Hispanic students, and students with 25 earned credits or more.

Southwest Tennessee Community College ranked 12th in dual enrollment participation and 12th in matriculation. As with Nashville State, Southwest Tennessee fell below average in all categories except matriculation of female students. Southwest Tennessee also showed a strength in the matriculation of Asian students where they were slightly below average. Areas of improvement for Southwest Tennessee include matriculation of students with a GPA below 2.0, those with a GPA between 2.50 – 2.99 (13th), and students with an ACT score over 26 (13th).

Volunteer State Community College ranked 1st in dual enrollment participation and 10th in matriculation rates. Volunteer State consistently ranked average across the board. In multiple

areas, Volunteer State was above the mean as well as below the mean. Volunteer State showed the greatest strengths in their matriculations of students with an ACT score of below 15 (1st), as well as a 31-36 (1st), and matriculation of Asian students (3rd). They also were above average in the matriculation of multiracial students. Areas of improvement for Volunteer State include the matriculation of female students and additionally, matriculation rates for students who have earned 19 or more credits. Volunteer State fell below average in both.

Walters State Community College ranked 3rd in total dual enrollment participation and ranked 1st in matriculation rates. Walters State consistently ranked above average in most areas related to matriculation. Walter State showed the greatest strengths in their matriculation rates for Hispanic students (2nd), Asian students (3rd), as well as students who completed from 1-12 credits of dual enrollment (1st). Walters State also matriculated a higher percentage of students with a high school GPA of 3.0 - 3.49 than they did those at 2.50 - 2.99. Areas of improvement for Walters State include the need to increase male matriculation as well as increase Black, Not Hispanic student matriculation rates.

Recommendations for Practice

Findings from this study may assist the TBR in learning more about rates at which their community colleges are matriculating dual enrollment students. One of the ways in which the TBR can use this data is to analyze the potential gains in revenue from higher matriculation rates. One example is Southwest Tennessee Community College. The 2023 cost of an in-state student completing 12 credit hours of coursework amounts to approximately $2,200 a semester, or $4,400 a year. If Southwest Tennessee were to have increased its matriculation rates from 12.04% to 15%, an increase of matriculated students from 544 to 677, the institution would have earned approximately an additional $585,200 in revenue. The TBR can also utilize the findings

from the study to build a communication plan to strategically recruit dual enrollment students. For instance, Northeast State matriculated students who have earned 25 or more dual enrollment credits at over a 65% rate. Students who earned between 19 to 24 dual enrollment credits matriculated at a 52% rate. This data can inform and encourage Northeast State to push their students to get the 25 earned credit mark. Statistically, these students become more likely to matriculate after they earn 25 credits. Additionally, the TBR can utilize the findings to better advise their dual enrollment students. Each institution found their strengths and weaknesses with different groups of students. Again, Northeast State matriculated students who have earned 25 or more dual enrollment credits at over a 65% rate as compared to 29% for students who earned between 13 and 18 credits. One recommendation is that institutions develop advising plans for dual enrollment students. This could potentially lead to students completing more credits of dual enrollment. Finally, the findings demonstrate that minority students matriculate at a lower rate than their peers. The information from this study can be used to encourage deeper discussions regarding academic support for minority students in dual enrollment. Not only did the minority students matriculate at lower rates, but the institutions that serve larger populations of minority students, such as Southwest Tennessee and Nashville State, fell near the bottom in matriculation rates. Accessibility to academic support for minority students could potentially lead to an increase in matriculation rates for students from minority groups.

Recommendations for Further Research

Throughout 2016 to 2021 the TBR community colleges saw slight growth in their dual enrollment programs. One main reason for this time frame for the study was the implementation of the Tennessee Promise. Tennessee implemented the Tennessee Promise program in the 2015-2016 academic year. All students who were represented in this study had the ability, as long as

the requirements were met, to qualify for Tennessee Promise. In reviewing a variety of variables regarding matriculation, the study allows institutions to better understand the rate at which certain students matriculate. Most importantly, institutions can use the data moving forward to build a recruitment plan and potentially grow enrollment. Implications for further research as detailed below:

1. Research should be conducted to incorporate first-generation information. My study did not include students who were listed as first-generation, this data would allow community colleges to better comprehend the rate at which these students matriculate. In some cases, first-generation students can be considered at-risk students. This would add an additional demographic for community colleges to consider.
2. Research should be conducted to incorporate the delivery method in which classes were taught. In reviewing this information, community colleges would be able to better understand how the delivery of classes may potentially impact matriculation rates.
3. Research should be conducted on the distance students reside from a community college campus. In some cases, students could live closer to a 4-year institution than they do a community college.
4. Research should be conducted on matriculation rates prior to Tennessee Promise. The Tennessee Promise program offers last-dollar scholarships that in many cases cover the full tuition at a community college. Institutions would be able to use this information and compare it to the study years of 2016-2021 to better appreciate the potential impact Tennessee Promise could have on matriculation rates.
5. Qualitative studies should be conducted to discover the reasons that students choose to matriculate as well as choose not to matriculate.

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