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The Contribution of Early Postsecondary Opportunities to Retention and Graduation Rates at
One Community College in Tennessee

A dissertation
presented to
the faculty of the Department of Educational Leadership and Policy Analysis
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Doctor of Education in Educational Leadership,
concentration in Higher Education Leadership

by
Joe Wingate
May 2022

Dr. James Lampley, Chair
Dr. John Boyd
Dr. Donald Good

Keywords: early postsecondary opportunities, graduation rates, retention rates

ABSTRACT

The Contribution of Early Postsecondary Opportunities to Retention and Graduation Rates at
One Community College in Tennessee

by

Joe Wingate

The purpose of this non-experimental, quantitative, comparative study was to determine whether there were significant differences in fall-to-fall retention and graduation rates, between first-time, full-time students who engaged in at least one early post-secondary opportunity (EPSO) while in high school and those who did not. Archival data for this study were collected from the participating community college between 2015 and 2018. The sample for this study included 2,911 students enrolled in academic programs at the community college and included retention rates and graduation rates for students who participated in EPSOs (N = 622) and those who did not participate in EPSOs (N = 2289). Other data collected for each participant included: (a) socio-economic status as determined by Pell eligibility, (b) at-risk status as determined by an ACT score of 17 or below, and (c) gender. Chi-square tests using a two-way contingency table with cross tabs or independent sample t-tests were used to evaluate each of the research questions. The findings demonstrated that participation in EPSOs resulted in increased retention and graduation rates. Findings from this study may contribute to the existing body of knowledge as to whether high school participation in EPSOs is associated with improved retention and graduation rates at community colleges.

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DEDICATION

To my Lord and Savior Jesus Christ, who has given me life everlasting. To my family, both immediate and extended, who have influenced me in ways they will never know.

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Chapter 1. Introduction

As far back as the early 20th century, state and federal lawmakers have been concerned with students' ability to meet the demands of higher education and the workplace when graduating from secondary education environments. Increasing reliance on technology and specific skill training, along with the elevated academic rigor mandated by both federal and state legislators, has heightened educator awareness regarding identification of best practices for ensuring student success in postsecondary settings.

Determining the college and career readiness (CCR) of high school graduates has traditionally been difficult to measure. The data most recently used to assess CCR have shifted from postsecondary enrollment numbers and percentages to retention and completion figures. By any measurement, secondary schools have not traditionally sufficiently prepared students for a successful (as determined by completion of a postsecondary degree or industry certification) transition to postsecondary education. National statistics indicate that only about 4 in 10 Americans have obtained either an associate or a bachelor's degree by their mid-twenties (Symonds et al., 2011). The argument has been made that early exposure to either college level curriculum or career and technical skill training enhances the opportunities for student postsecondary success. As school systems across the country work to meet the needs of higher education and the workplace, it becomes essential to investigate factors that will provide the most optimal opportunities for student success.

A review of literature confirms the need for increased attention to CCR and a heightened awareness, by both local education agencies (LEAs) and community colleges, to provide multiple options regarding early postsecondary opportunities (EPSOs). This study examined the achievement data of high school students enrolled in one or more EPSOs, specifically dual

enrollment, and compared it with the retention and completion rate data for those students at the local community college. The study examined the effect that exposure to early postsecondary opportunities (EPSOs), specifically dual enrollment, contributes to postsecondary success as measured by retention and attainment of a college degree.

Statement of the Problem

Increased accountability, in terms of student success for community colleges in Tennessee, has traditionally been measured by student retention and completion rates. Student success metrics for local education agencies (LEAs) have commonly been assessed by the number of students deemed college and career ready. The desire of LEAs to produce students who can more easily transition into a postsecondary environment, and the push for community colleges to increase retention and completion rates has led to increased engagement in partnerships between LEAs and community colleges seeking to improve student success rates by providing expanded access to EPSOs.

The purpose of this non-experimental, quantitative, comparative study was to determine if there are significant differences in the graduation rates and fall-to-fall retention rates between first-time, full-time students who engaged in at least one early post-secondary opportunity (EPSO) while in high school and those who did not. In addition, gender, Pell eligibility, and at-risk status was considered.

The independent variables included participation in EPSOs, gender, Pell eligibility, and at-risk status (academically underprepared). The dependent variables were first-time, full-time fall-to-fall retention rates and 3-year graduation rates for full-time community college students.

Research Questions

The research questions of this study were intended to determine whether engagement in early post-secondary opportunities (EPSOs) predicted graduation rates and fall-to-fall retentions rates for first-time, full-time students at the participating community college. For each of the research questions only community college students who graduated from the participating, urban, K-12 public school system were included in the analyses. More specifically, the following research questions were investigated.

Research Question 1: Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

Research Question 2: Is there a significant difference in the mean number of dual enrollment EPSOs between students who graduated within 3 years and students who did not graduate within 3 years at the participating community college?

Research Question 3: Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by gender?

Research Question 4: Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by Pell eligibility status?

Research Question 5: Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by at-risk status?

Research Question 6: Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

Research Question 7: Is there a significant difference in the mean number of dual enrollment EPSOs between first-time, full-time, students who were retained fall-to-fall and students who were not retained at the participating community college?

Research Question 8: Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by gender?

Research Question 9: Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by Pell eligibility status?

Research Question 10: Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by at-risk status?

Research Question 11: Is there a significant difference in the proportion of students who graduated within 2 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

Research Question 12: Is there a significant difference in the number of dual enrollment EPSOs between students who graduated within 2 years and students who did not graduate within 2 years at the participating community college?

Significance of the Study

According to the research of An & Taylor (2015), Fink et al. (2017), Grubb et al. (2017), Prophete (2013), Speroni (2011), Struhl & Vargas (2012), the ability of local education agencies (LEAs) and community colleges to create access and exposure to EPSOs has proven beneficial to student success in studies across the country. Research regarding dual enrollment, in particular, has discovered measures of student success in various demographic sectors such as gender, race, socio-economic status (Barnett & Stamm, 2010; Hoffman et al., 2009). In those studies, retention and completion rates increased for students who engaged in dual enrollment courses in comparison with their peers who had not. Access to dual enrollment has been accomplished through college coursework offered on high school campuses, early college programs, and other formats that emerge from partnerships between LEAs and community colleges. LEAs focus on preparing students for postsecondary life while community colleges are constantly seeking strategies to retain and help students complete degree programs (Adelman, 2006; An & Taylor, 2015; Attewell & Domina, 2008; Taylor, 2015).

Definitions of Terms

In this study, the following terms are defined as follows:

Advanced Placement (AP) – courses taught using a standardized curriculum intended to be college level, by which students can receive college credit by passing the associated optional exam (Speroni, 2011).

Career and Technical Education (CTE) – education that focuses on transitioning students through secondary and into postsecondary education to gain competencies and enter careers that provide a living wage (Bragg & Rudd, 2007).

College and Career Readiness – the determination of whether a student is ready for college and career and can qualify for and succeed in entry-level, credit-bearing college courses leading to a baccalaureate or certificate, or career pathway-oriented training program without the need for remedial or developmental coursework (Conley, 2012).

Completion Rate – the ratio of unduplicated counts of students reaching completion divided by the total number of students in a particular tracking cohort (Marlowe et al., 2016).

Dual Enrollment Programs – programs that allow high school students to enroll in college courses before high school graduation, giving them firsthand exposure to the requirements of college-level work and allowing them to gain high school and college credit simultaneously (Bailey et al., 2002).

Early College – a type of educational format located on a college campus, allowing students to begin taking college courses while combining the high school and college experience (Edmunds et al., 2020).

Early Postsecondary Opportunity (EPSO) – a set of courses and/or exams that give students a chance to obtain postsecondary credit while still in high school (Tennessee Department of Education, 2017b).

Limitations and Delimitations of the Study

My study compares student success outcomes with regards to EPSO participation, gender, Pell eligibility, and at risk status at a community college in Tennessee. A limitation of this study includes the assumption that dual enrollment courses taken have a positive effect on community college completion rates. Another limitation of the study is the assumption that dual enrollment courses taken positively affect the completion rates of at-risk and Pell eligible students. This study also assumes that more dual enrollment courses taken by a student increases the likelihood of fall-to-fall retention and degree completion.

This study is delimited to students who graduated from the participating LEA and then subsequently matriculated and completed a degree path in 3 years, at the same community college. Students who met the same qualifications, but from high schools outside of the aforementioned LEA were excluded from the study. The results of this study may not be generalizable to other groups of students who have completed a community college degree in the same amount of time. The study includes the selection of EPSOs offered by the LEA in any of its 23 high schools.

Overview of the Study

Chapter 1 includes the introduction, purpose statement, significance of the problem, research questions, definitions of terms, delimitations, limitations, and assumptions of the study. Chapter 2 presents a review of the current literature that relates to the research questions posed. Chapter 3 contains the methodology for this non-experimental, quantitative, comparative study. Chapter 4 displays the research findings and results. Finally, Chapter 5 provides the discussion, conclusions, and recommendations.

Chapter 2. Review of Literature

Postsecondary success has at times been defined rather vaguely. However, Conley (2012) presented a definition of postsecondary student success that is the product of 18 years of study and research. The research that ultimately led to this working definition included proficiency-based college admissions, national studies on college and career standards, studies of career preparation programs, and information gleaned from the teaching practice incorporated into tools and strategies for preparing students. Thus, the definition of postsecondary included "...any formal setting in which an individual pursues additional instruction beyond high school" (p. 1). The author also identifies success as being "...student success in their chosen field of postsecondary education or post-high school training" (p. 1). Preparedness for high school students in terms of entering college has many times been defined as college readiness. College readiness is "the level of preparation a student needs to enroll and succeed in a college program without requiring remediation" (Venezia & Jaeger, 2013, p. 118).

For some time postsecondary institutions and business and industry have expressed concern over the lack of competitive candidates for programs and employment who are graduating from secondary schools in the United States. Many high school graduates enroll in some form of postsecondary training but fail to complete. Young et al. (2016) focused on the lack of preparation of high school graduates to compete in college and the workforce. Young's research found that preparing students for postsecondary success had become an issue of growing concern across the United States and indicated that one-half of all students in community colleges take remedial courses and those hiring in the workplace claim that high school graduates are inadequately prepared. In an effort to increase the number of students more adequately prepared for what lies before them after graduation many school systems have

endeavored to increase the amount of early postsecondary opportunities (EPSOs) available to students. Young et al. also sought to determine relationships between engagement in EPSOs and postsecondary enrollment. The study was focused specifically by the research team on three EPSOs: AP enrollment, CTE enrollment, and statewide dual credit. Their study also revealed that in the state of Tennessee 81% of jobs demand postsecondary education or training but only 32% of the available workforce have attained an associate degree or higher (Young et al., 2016). Symonds et al. (2011) referenced multiple reports that surveyed hundreds of employers describing high school graduates as being insufficiently prepared to be successful. The authors noted numerous employers in the technology industry who have collaborated to call for change in educational approaches. They also discussed the difficulty for young adults to be successful in the workplace without attaining a postsecondary credential or degree. Therefore, research has demonstrated a correlation between the attainments of postsecondary credentials or degrees and early exposure to college level curriculum or workforce training.

The Tennessee Department of Education (TDOE) has promoted EPSOs as a valuable tool to better prepare high school graduates for postsecondary life. In Tennessee, EPSOs are valued because they allow students to: a) earn postsecondary credits in high school, b) familiarize themselves with the expectations and requirements of college or business and industry, c) develop confidence and the skills needed for success in college coursework, d) make informed decisions regarding postsecondary plans, and e) reduce the time and cost of completing a certificate or degree (TDOE, 2017a). According to the TDOE, “Students who participate in early postsecondary courses are more likely to enroll and persist in college” (p. 21).

Community College Graduation Rates

There exists a general awareness of the benefits of postsecondary education, which leads to large percentages of high school graduates annually enrolling in postsecondary institutions. Many students and their families recognize the benefits of higher education as it pertains to the ability to increase earning power. The percentage of individuals who engaged in postsecondary institutions increased notably in the late 20th and early 21st centuries. “In the past 70 years, the college participation rate of high school students has increased almost eightfold, from 9% in 1939 to 70% by 2009” (An, 2013a, p. 3). That awareness however, did not translate to completion. As reported for the American Association of Community Colleges by Juskiewicz (2017), a large percentage of students who attended community college claimed that they intended to earn a bachelor’s degree although most did not get to completion. The number of students who enroll in community colleges as compared to those who complete degrees, has traditionally been a source of frustration for two-year institutions. Juskiewicz (2017) found that 25.4% of the 2013 national cohort of first-time, full-time degree or certificate seekers to be completing or graduating from public, 2-year institutions.

A lack of accurate and consistent completion measures added to the frustration of community colleges’ attempts to improve student success rates. Both the U.S. Department of Education and the National Student Clearinghouse (NSC) report annually on enrollment numbers and student outcomes for higher education institutions. According to Juskiewicz (2017), the most recent pre-COVID findings noted more than 39% of all community college students earned a credential, with the U.S. Department of Education showing a 25% completion rate. The disparity in those numbers could be attributed to the manner in which each entity tracked and assessed the performance of community college students. The U.S. Department of Education

data traditionally contained a 3-year window for completion of community college programs and did not consider students who transferred into or out of other institutions (Juszkiewicz, 2017). In contrast, the NSC has traditionally followed community college students for a span of 6 years and across multiple institutions. According to this method 39.3% of the community college students completed programs either at the institution where they first enrolled or at a different one within 6 years (Juszkiewicz, 2017). When statisticians limited the cohort to control for students who attended community college exclusively full-time, regardless of whether they completed at the institution where they began or at another community college, the NSC found graduation rates increased to 55% (Juszkiewicz, 2017). The U.S. Department of Education recently expanded its tracking parameters for measuring student outcomes to include an 8-year window and consideration of not-first-time and part-time status. “The length of time that community college students are tracked, as well as taking into account transfer to other institutions, makes a considerable difference in completion rates” (Juszkiewicz, 2017, p. 7).

Since 2010, community college graduation rates have gradually increased annually (Juszkiewicz, 2020). However, during this period, not all subgroups have completed at the same rate. According to Juszkiewicz, women completed community college programs at a rate of 44%, compared to a 39% completion rate for men. In terms of income levels (socio-economic status), An (2013a) reported that “Approximately 26% of college students from the bottom quartile of the income distribution attained a degree by age 25 as compared to 59% of college students from the top quartile of the income distribution” (p. 3). In addition, Troester-Trate (2020), reported a community college completion rate of 30% for students identified as coming from low-income households.

Fall-to-fall retention has traditionally been used as a metric of student success in community colleges. According to the National Student Clearinghouse Research Center (2019), “Of all students who started college in two-year public institutions in fall 2017, 48.9% returned to the same institution in fall 2018” (p. 7). When considering only full-time students, that percentage increased to 60.1% (National Student Clearinghouse Research Center, 2019). Windham et al. (2014) found that gender played a significant role in fall-to-fall retention rates. More specifically, “females had a 94% higher chance of fall-to-fall retention than males” (p. 475). The research did not study ACT scores directly, but did find correlation between higher ACT Reading Compass test scores and retention rates. When considering college readiness and possible at-risk academic status, Windham et al. found that fall-to-fall retention increased 1.2% for every one unit increase in a student’s score.

College graduation rates, community college or otherwise, should continue to be an area of focus in the near future. At the time of this study, government intervention regarding college admission procedures in many states included the removal of ACT and SAT scores as required components for application to higher education institutions. Although standardized testing has long been used as a measure of college readiness, many critics of the exams claimed that they were not valid evaluations of classroom learning, poorly predicted future performance in college courses, and favored students and families with greater financial resources and better opportunities for preparation (Venezia & Jaeger, 2013). In Tennessee, regardless of ACT score, students with EPSO experience are more likely to graduate high school (TDOE, 2017a).

Types of Early Postsecondary Opportunities

Early postsecondary opportunities have proven to be extremely impactful in terms of increasing access and success for students of all backgrounds. Many states have turned to

increasing exposure to EPSOs as a strategy in enhance the postsecondary success rate of students. Efforts have been particularly focused on members of underrepresented groups, such as ethnic minorities, low income, first generation, or those not academically ready for college-level work. LEAs have typically turned to community colleges to partner in this work. Because of their open access mission and their relationship to state and local governing bodies community colleges are often better suited for educational reform initiatives in their communities (Bragg et al., 2006). Hoffman (2005) asserted that partnering with local community colleges could be opportunistic for LEAs seeking increased student exposure to EPSOs. EPSOs can include career and technical training, early college programs, advanced placement (AP) coursework, or dual enrollment. All of the aforementioned allow for high school students to become more familiar with the expectations that await them after graduation. In some states students headed for career and technical certificates and associate degrees make up half of dual enrollments (Hoffman, 2005).

In Tennessee, EPSOs include the following offerings: local dual credit dual enrollment, industry certification (career and technical education), statewide dual credit, advanced placement, international Baccalaureate, Cambridge international examination, and a college level examination program (TDOE, 2017a). Hyde (2020) found that EPSOs were essential for post-secondary success. She reported that participation in AP math or English or dual enrollment coursework correlated with increased 2-year completion rates in Tennessee, when compared to students who did not participate.

Career and Technical Education

In terms of preparing students for postsecondary success in the workforce, researchers revealed that EPSOs pertaining to career and technical education benefitted students immensely.

In drawing attention to the gap between the jobs of the future and the deficient preparation of today's young adults, Symonds et al. (2011), advocated a call to improved academic instruction and a focus on career and technical education. These changes focused on skills needed in the current workforce. The National Forum on Education Statistics (2015) defined career and technical education as "a term applied to schools, institutions, and educational programs that specialize in preparing students for careers primarily in skilled trades, applied sciences, or modern technologies" (p. vi). This work indicated that a focus on college readiness alone could not prepare young people with all of the skills and abilities required in the workplace, nor would it allow them to navigate the transformation from adolescence to adulthood successfully (Symonds et al., 2011). As with many others, the authors highlighted the successes of many career and technical education (CTE) programs in regards to preparing students for college life as well or better than some exclusively academic programs. To strengthen the argument, the report discussed research pertaining to career education and training in European countries. The Organization for Economic Cooperation and Development commissioned two reports, covering 16 countries, which produced considerable data supporting the advantages of work-based learning. The reports provided compelling evidence that vocational education that integrated work and learning was a superior way to learn (Symonds et al., 2011). In 2012, Alfeld and Bhattacharya examined curricula, called career technical programs of study, intended to support transitions to college. Their study referenced reports that made the claim that other nations provided better career preparation for secondary and postsecondary students. The authors also pointed to a report that "suggested that high-quality work-based learning with strong links to the labor market...is the best way to prepare young people for careers" (p. 120). The reports referenced were instrumental in energizing educators and policymakers in regards to creating

better links and pathways between secondary and postsecondary training. Alfeld and Bhattacharya's study included case studies from three programs of study labeled as mature, which were chosen for participation in a longer longitudinal study. The findings indicated that students felt involvement in programs of study positively influenced their career directions and that programs of study had the potential to show students the range of education and work options after high school. Findings also determined that based on the small proportion of students transitioning to college from the programs of study they started in high school, there was no guarantee that students would continue to progress through it. However, students continued on in postsecondary training regardless of the career path to which they had been exposed (Alfeld & Bhattacharya, 2012).

Bragg and Ruud (2007) provided a brief summary of a study on the effects of (CTE) programs on student transitions from secondary to postsecondary environments. The study focused on the postsecondary outcomes of students who participated in CTE transition programs and those who did not participate in those programs from the same high schools. Both components of the study examined the relationship between student outcomes and institutional engagement in CTE transition programs (Bragg & Rudd, 2007). The researchers employed a mixed method design that used both qualitative and quantitative data and involved 52 high schools that offered the same CTE curriculum as a large, local community college. Each of the high schools had articulation agreements with the college leading to cohesive relationships between secondary and postsecondary institutions. Castellano et al. (2007) concluded that participation in CTE coursework decreased the dropout rate and they recommended further exploring the motivational power and the holding power of non-academic courses such as CTE

and others that would allow for developing adolescents to foster characteristics of themselves other than those of an academic nature.

Combined Effects of Academic Rigor and CTE

Researchers also indicated that the academic rigor of AP and dual enrollment along with acquisition of workforce skills in CTE was mutually beneficial. (Bragg & Rudd, 2007; Hughes et al., 2012). A report by The College and Career Readiness and Success Center (2013) focused on research that identified measures of postsecondary success such as student skills, behaviors, and other characteristics that predicted future academic and workplace success. At the secondary level, an abundance of factors have been identified. The report also detected indicators of postsecondary success that included an attendance rate of 90% or better, a GPA of 3.0 or higher, and passing exams corresponding with successful enrollment and completion of entry-level college credit courses. Regarding workforce or career readiness, the study reported that involvement in a career-concentrated program also paralleled postsecondary persistence. These factors, along with participation in dual enrollment, senior year transition programs, and other bridge-type programs, were pivotal indicators of post-secondary success according to the report (College and Career Readiness and Success Center, 2013).

Hughes et al. (2012) focused on the Concurrent Courses initiative that consisted of support for several partnerships among secondary and postsecondary institutions in California. The authors shed light on the current predicament when discussing the abnormally high rate at which students exited postsecondary institutions without program completion. Hughes et al. also described a clear benefit to prescribing curriculum that allowed for accruing knowledge and skill in both the academic and workforce realms. The findings echoed many previous reports in restating that exposure to EPSOs, specifically dual enrollment opportunities, "...correlated with

a range of positive high school and college outcomes, including college enrollment and persistence” (p. 9). Dual enrollment opportunities typically resulted from partnerships with school systems and community colleges and involved both academic and workplace training pursuits. While many studies focused on academic achievement when seeking to determine college readiness, research by Bragg and Rudd (2007) indicated that students involved in CTE programs achieved higher academically on standardized tests than did students not enrolled in career and technical education. Conley (2012), asserted that being ready for both college and a career were very similar but not the same. He stated that analyses noted considerable overlap in the skills needed for success in both arenas. He also acknowledged that “...while the foundational content knowledge is similar in all cases, the precise skill associated with success in a career course pathway may be more focused than that required for a bachelor’s degree” (p. 4). Conley’s study points to the need for secondary schools to prepare all students with a common foundation in academics while also recognizing the interests and energies of students in specific career pathways.

Early College

The lack of retention and completion of high school students who enroll in and attend college has long been an issue for higher education institutions. Ross et al. (2012) found that approximately 70% of high school graduates directly entered into postsecondary education, with roughly one-half of them (49%) earning some type of postsecondary credential within 6 years. Efforts to improve success rates have included implementation of various strategies at both the secondary and postsecondary levels. Increasing access to college-level content, via dual enrollment coursework, was one of those strategies. According to Edmonds et al. (2020)

students' entry level of academic achievement and preparation strongly correlated with success in postsecondary education.

Early colleges are a type of dual enrollment strategy that purpose to provide access to the academic rigor of college courses and also offer the opportunity to graduate from high school with one to two years of college credit completed. These schools have evolved through partnerships between school districts and local postsecondary institutions (Barnett & Stamm, 2010). Early colleges combine the structural functions of high schools and colleges and provided opportunities for students to attend class primarily on community college campuses. Since their launch in 2002, early college high schools have created a fast-growing pathway model. In addition special efforts in twenty-one states use early colleges to assist low-achieving students and racial and ethnic minorities (Bragg et al., 2006).

Creating more access to postsecondary success and increasing the likelihood of postsecondary degree attainment is embedded in the early college model. The solution offered by early college programs could improve the likelihood of underrepresented students earning a college degree by enrolling students in college courses while they were in high school and receiving support from high school staff (Berger et al., 2013). Early colleges have been shown to increase the diversity of students engaging in college coursework, increase the number of college credits earned by completion of high school, and also increase attainment of two- and four-year degrees. In examining graduation data from 64 early colleges, Webb and Mayka (2011) found that 24% of graduates who had attended an early college for four years eventually completed an associate degree or the equivalent of two years of college coursework.

Florida, Minnesota, and Mississippi reported particular progress regarding students who engaged in dual enrollment opportunities at community colleges. In these three states more than

60% of those students earned either a community college credential or a bachelor's degree (Fink et al., 2017).

International Baccalaureate

The International Baccalaureate (IB) Diploma Program has existed as an EPSO that predates many of the current advanced learning opportunities. The program began in 1968 in Geneva, Switzerland and has grown in popularity among public schools in Canada and the United States (Resnick, 2012). In the spirit of improving college and career readiness, the IB collaborates with schools, governmental agencies, and other organizations to promote challenging international education along with stringent evaluation (Conley et al., 2014). IB programs have also traditionally sought to incorporate a culture of learning along with the previously mentioned elevated academic expectations in order to promote and develop lifelong learning and critical thinking skills.

Student participation in IB has been shown to positively affect college readiness. Conley et al. (2014) found that students who participated in IB were better prepared for college when considering both academic and non-academic factors. Students reported feeling more academically adjusted to the rigor of college coursework and that they felt better able to cope with the workload and manage their time while engaged in their courses (Conley et al., 2014). Coca et al. (2012) noted that students from the Chicago public school system who participated in IB reported feeling better prepared to succeed in their college coursework. Coca et al. also found that the IB Diploma Program students achieved better postsecondary outcomes (persisting for at least two years at a four year institution) and that the students reported development of non-academic skills which facilitated their ability to manage their own learning.

The IB diploma program has displayed effectiveness and should be considered a valuable EPSO by school districts and policymakers in search of opportunities to bolster college and career readiness. One of its benefits was the ability to help students gain the skills needed to succeed in a postsecondary world and to successfully matriculate to the completion of a degree (Conley et al., 2014).

Tennessee Statewide Dual Credit

In an effort to increase student EPSO exposure and encourage the creation of pathways to success that extended beyond high school, the State of Tennessee passed Senate Bill No. 2809 (Public Chapter No. 967) in April of 2012. This law established a partnership of state agencies that were charged with expanding EPSOs for high school students across the state (Hemelt et al., 2020). The combined focus of these agencies turned to dual-credit coursework as a primary means of early postsecondary exposure for the state's high school students. The statewide dual credit (dual enrollment) program allowed for college-level courses to be taught on high school campuses. Hemelt et al. reported that prior to this legislation, there had been little to no systematic expansion of dual-credit opportunities for high school students in Tennessee. In 2008 several colleges received state approval for dual enrollment agreements with certain high schools. One-half of those state approved pilot programs subsequently failed to survive. Tennessee's educators attempted to align expectations, standards, and assessments to create academic opportunities designed to prepare high school graduates for postsecondary life (Hemelt et al., 2020).

Successful completion of a statewide dual credit course could enable students to earn college credit before actually entering a college or university, full time. To gain the credit, students must demonstrate mastery of learning objectives with a qualifying score on the end of

course examination. Students who meet or exceeded the exam qualifying score receive college credit that may be applied to any Tennessee public postsecondary institution (Tennessee Department of Education, n.d.). In a study to determine the effectiveness of a dual credit algebra course, Hemelt et al. (2020) found that participation in the course altered students' math course-taking trajectories during late high school, shifting students away from remedial or lower-level options and toward more advanced math courses.

Advanced Placement and Dual Enrollment

Traditionally, there has existed a strong correlation between students who participated in and completed advanced placement (AP) and dual enrollment courses, and postsecondary degree attainment. "Providing high school students access to advanced coursework has long been considered an important means of preparing students for success after high school" (Handwerk et al., 2008, p. 3). The AP program allows students who take its courses to secure college credit at institutions of higher education by achieving a satisfactory score on the final AP exams. The College Board started the AP program in the late 1950s so that high schools could offer advanced academic content for high-achieving students. The program which operates as a partnership between secondary and postsecondary institutions provides opportunities for high school students to participate and engage in freshman college courses for the purpose of earning credit. With more than 2 million students taking more than 3 million AP exams annually, it has become one of the most prevalent EPSOs currently used in America (Warne, 2017). According to the report by Handwerk et al., 58% of U.S. high schools offered some form of AP program. While participation in AP coursework has remained a popular option for American high school students, few actually benefitted. Handwerk et al., using data provided by the College Board, found that few students who took an AP course ever took the AP exam associated with that

course. An even smaller percentage of those who did take an exam scored well enough to qualify for college credit. An examination of the data provided by the College Board found that a median of 1 to 4% of students taking AP courses attained a grade of 3 or higher, making them eligible for college credit. The College Board's data indicated that females were more likely to take AP courses than males and that ethnic disparities also existed. Participation by ethnicity showed that 10.3% of Asian American students, 5.3% of White students, 2.4% of Hispanic students, and 0.5% of African American students took an AP exam. In terms of socio-economic status, the data revealed that less than 1% of low-income students took an AP exam in high schools that offered AP programs (Handwerk et al., 2008).

Although AP and dual enrollment programs have generally been offered only to higher achieving students research indicated that exposing low achieving and average achieving students to college level curriculum has shown benefits. Karp et al. (2007) examined the effectiveness of dual enrollment programs in impacting postsecondary success in Florida and New York. Dual enrollment could offer benefits to all students, not just those who would be considered high-achieving. "Today a variety of policymakers, authors, educators, and foundations argue that many students, not only those with outstanding educational credentials, may benefit from participation in a dual enrollment program" (Karp et al., 2007, p. 1). Speroni (2011) focused on the strong association of Advanced Placement (AP) and Dual Enrollment courses in producing positive outcomes regarding student access and success. Speroni explored correlations between participation in AP and dual enrollment programs and postsecondary success as measured by enrollment in college and completion of an undergraduate degree. Investigation of the effects of these two types of EPSOs also included an acknowledgement by the author that "While both programs were initially limited to academically advanced students,

they are increasingly serving a wider student population, including middle- and even low-achieving students” (Speroni, 2011, p. 2). This statement was relevant in relation to other information presented because it was consistent with the research in showing opportunities for success among students of all achievement levels. Dougherty et al. (2006) focused on the effects of AP course participation and exam success on college graduation rates. The authors referenced the increase in AP course participation and sought to determine whether that increase affected postsecondary success. The report indicated that, on average, a school with “...100 additional students passing AP exams from the school’s cohort of low-income students would expect to gain 32 additional college graduates from that same cohort” (Dougherty et al., 2006, p. 10).

As mentioned in the report by Hughes et al. (2012), career-focused dual enrollment programs, in particular, “...allow high school students to take college courses and earn college credit, [that] were once offered almost exclusively to high-achieving students seeking greater academic challenge” (p. 4). Speroni (2011) compared data from a pair of cohorts that included all public high school students in Florida and found that both AP and dual enrollment course-taking significantly related to a student’s probability of enrolling in college after high school, enrolling in a four-year college, and eventual attainment of a degree. An interesting find resulting from the review of literature by Speroni revealed that dual enrollment students tended to have greater likelihood of persisting in college or in completing an undergraduate degree than did AP students.

Dual Enrollment

Dual enrollment programs have been used as a structure to ensure collaboration between secondary and postsecondary institutions. Bailey et al. (2002) noted that dual enrollment programs “...are often seen as a way to offer high school students access to coursework not

available at the high school as well as a means of exposing them to the academic demands of college” (p. 9). Dual enrollment courses allowed high school students to experience the cadence and expectations that existed in a college course. This exposure has traditionally been limited to higher achieving students, but in recent years dual enrollment has been expanded to include those achieving at lower levels. This exposure could serve to encourage higher achieving students to continue to seek challenging content and rigor, while also allowing less academically accomplished students to become more comfortable with what might be perceived as a more intimidating academic environment. Dual enrollment could provide a means to increase a student’s exposure to high-level, challenging coursework prior to enrolling in a post-secondary institution (Bailey et al., 2002). Dual enrollment exists in every state in the U.S. and is the predominant avenue used for creating access to postsecondary education. Forty-five states support this pathway through various policy mechanisms, and 16 name dual enrollment as a priority for increasing access to college in their state (Bragg et al., 2006).

In Tennessee increasing access to community college has become a strategy for providing more opportunity for attaining a postsecondary credential and college completion (Tennessee Department of Education, 2017c). As community colleges and LEAs have partnered in efforts to ease the transition to postsecondary education, dual enrollment programs have been seen as a foundational tool in that process. Dual enrollment participation, the earning of college course credit during high school, has been shown to benefit students in being college ready and in completing college (Grubb et al., 2017). A study of dual enrollment participants in Texas by Struhl and Vargas (2012) revealed that dual enrollment participants were “2.2 times more likely to enroll in a Texas two- or four-year college, 2 times more likely to return for a second year of college, and 1.7 times more likely to complete a college degree” than were non-dual enrollment

students (p. vi). Struhl and Vargas examined numerous studies for methods controlling for such things as the influence of preexisting student characteristics and eventual college outcomes for student groups. The authors (2012) found that most studies consistently showed positive correlations between dual enrollment and college outcomes, many did not focus on degree completion. Struhl and Vargas also uncovered a limited body of literature focused on the extent to which student backgrounds affected student outcomes. Understanding how dual enrollment and other college readiness programs impacted low achieving (at risk), low SES, and gender groups, was vital in assessing their effectiveness.

Grubb et al. (2017) pointed out that completion rates in higher education, along with the time elapsed for completion, have long been used as metrics for student success. Community colleges offer the broadest access to diverse student populations and could provide opportunities for students to complete a degree or credential in a much shorter time frame. Also noted by Grubb et al., completion has often been studied in the dual enrollment literature, but rarely has the analysis emphasized the completion of associate degrees earned at the community college and rarely has the interval for completion examined been suitable to assess timely completions. With dual enrollment participation growing significantly on a national scale, student access to college coursework while still in high school increased the opportunity to complete a college degree in a more efficient manner.

The number of high school students taking advantage of dual enrollment courses through community colleges has increased considerably since the beginning of the twenty-first century. According to Fink et al. (2017), “From 1995 to 2015, fall enrollments of students aged 17 or younger at community colleges grew from 163,000 to 745,000” (p. 3). Fink et al. also confirmed findings from Shapiro’s 2016 study that students who earned an associate degree and

participated in dual enrollment completed that degree two years earlier than those who did not participate. The analysis of national data from the National Student Clearinghouse by Fink et al. was of note. In particular, the authors found that 46% of former dual enrollment participants who enrolled at a community college after high school completed a college credential within five years and that 64% of former dual enrollment participants who enrolled at a four-year institution after high school completed a college credential within five years. In her study of dual enrollment programs in Florida, Prophete (2013), reported that "...participation in dual enrollment increased the likelihood that a student would persist and attain a college degree" (p. 57). She also found significant differences between persistence and degree completion rates among students who participated in dual enrollment and those who did not.

An and Taylor (2015) suggested that dual enrollment should be a strategy employed by LEAs and postsecondary institutions. Dual enrollment is arguably in the best interest of high schools and colleges, because it is likely to improve LEAs' post-graduation outcomes and colleges' retention and graduation outcomes. It would seem beneficial for LEAs and community colleges to increase resources to partnerships that develop dual enrollment programs beneficial to both organizations.

Dual Enrollment and Pell Eligibility

Several studies have shown that students in high socio-economic status (SES) subgroups are consistently more academically prepared and have higher percentages of degree attainment (An, 2013; Haveman & Wilson, 2007; Taylor, 2015). Approximately 28% of college students from the bottom quartile of the income distribution attained a degree by age 25 as compared to 66% of college students from the top quartile of the income distribution according to Haveman and Wilson (2007). Taylor (2015), reported that 84.2% of high SES students enrolled in college

immediately following high school while 54.1% of low SES students enrolled in college immediately following high school. In terms of bachelor degree attainment, 60.7% of high SES students completed a degree while 14.5% of low SES students completed a degree. These numbers aligned with participation in dual enrollment coursework according to SES. “High-SES students are more likely to participate in coursework that better prepares them for college than their low-SES counterparts” (An, 2013a, p. 3).

Research into the benefits of dual enrollment opportunities for students in low SES subgroups was not nearly as prevalent in the literature. Federal Pell Grant eligibility, a direct correlation to low socio-economic status (SES), has been used in prior studies for subgrouping purposes. It was therefore important to examine the influence of dual enrollment on academic performance and college readiness, and to discern whether these programs equally benefitted students across the SES spectrum (An, 2013b).

Equally important to understanding whether dual enrollment opportunities benefitted low-SES students’ academic achievement was exploring whether those students also had equitable access to dual enrollment coursework. Challenging high school coursework and the ability to earn college credit in high school have been viewed as positive indicators of college success in previous studies (Adelman, 2006; Attewell & Domina, 2008). It could also mean that dual enrollment participation by low income students could increase their likelihood of college enrollment and success. Across the nation, many state and local level policy-makers viewed dual enrollment as a pathway for low income students to have increased access to college (Taylor, 2015). Taylor reported that politicians and educators viewed and promoted dual enrollment as a model for decreasing educational inequities regarding college access and completion. According to An (2013), prior research has shown that low-SES students are less likely to participate in dual

enrollment than mid- and high-SES students. In many high schools with high percentages of low SES students, dual enrollments opportunities did not exist because of a lack of interest and funding. Much of that could be attributed to the educational level of immediate family members who might have less education than their children had. Also, many low SES students could not afford to pay the tuition of college coursework (An, 2013b). Without government funding or grants, dual enrollment opportunities tended to be more prevalent in middle to high SES families. In their study examining the correlation between curricular intensity and academic performance, Attewell and Domina (2008) asserted that curricular inequities existed between schools that served low SES students and schools that served students with predominantly high SES students because schools serving high SES families typically offered more advanced coursework. According to a report from the Tennessee Department of Education (TDOE) in 2017, economically disadvantaged students were 50% less likely to enroll in EPSOs than those with economic security (TDOE, 2017a). In particular, 29% of economically secure students took dual enrollment courses while 12% of economically disadvantaged students took dual enrollment courses (TDOE, 2017a).

Dual Enrollment and At-Risk Status

Although dual enrollment programs have traditionally been used to enhance academic opportunities for high-achieving students in recent years dual enrollment has been incorporated strategically for use with lower achievement groups. Barnett and Stamm (2010) found that “...interest is growing in using dual enrollment as a way to smooth the transition to college for students traditionally underrepresented in higher education” (p. 2). The increased interest stemmed from studies that showed the benefit of using dual enrollment for the purpose of increasing both college access and success for individuals who might not be ordinarily college

bound. Through access to dual enrollment underrepresented students could have the opportunity to gain a more intimate understanding of college expectations (Barnett & Stamm, 2010).

Many low achieving or academically at-risk students failed to attend postsecondary institutions because they did not necessarily envision themselves as able to succeed in a college environment. Emerging research and practice suggested that access to college-level work in high school was a promising way to better prepare a broad range of students for college success, including those who may not see themselves as college material (Hoffman et al., 2009). Attewell and Domina (2008) referenced a speech by President George W. Bush that identified the propensity of some schools to offer less challenging course offerings as attributable to an underestimation of the abilities of poor and minority children. Use of dual enrollment coursework for at-risk students could be designed to accomplish many of the same goals. Engagement in dual enrollment could provide exposure to knowledge and skills needed for postsecondary success, serve as motivation to persist in the pursuit of a postsecondary degree, and possibly ease the burden of tuition costs by decreasing the number of years needed for financial support (Hoffman et al., 2009).

Dual Enrollment and Gender

Historically, research concerning the effectiveness of dual enrollment in terms of gender has been inconclusive. Karp and Hughes (2008) studied New York City public school students who engaged in dual enrollment coursework and subsequently attended the City University of New York and found no significant outcome differences by gender. Karp et al. (2007) showed statistical differences in many subgroups analyzing a much larger set of data for Florida, with findings indicating that male participants were significantly more likely than female participants to enroll in college.

Participation data, as it pertains to gender, have also largely been inconclusive in previous research. In a study of public high school graduates in Virginia, data showed that although females comprised 50.6% of high school graduates, they made up 56.1% of dual enrollment participants. Males made up 49.4% and 43.9%, respectively. State level policy changes to the state's dual enrollment criteria created more inclusive protocols, however, after the change, dual enrollment of both male and female students as a percentage of high school graduates remained virtually unchanged (Pretlow & Wathington, 2014). Prophete (2013) found that 72% of dual enrollment participants were female and that gender was the strongest predictor of student persistence. She also reported that participation in dual enrollment was the strongest predictor for degree attainment.

Ganzert (2012) analyzed data from the 58 community colleges in the North Carolina Community College system to determine the effects of dual enrollment credit on gender in that state. Ganzert discovered that both female and male students who participated in dual enrollment courses benefitted in first-year GPA and had better graduation rates than those who did not take dual enrollment courses, and that female dual enrollment students graduated at a rate of 33.1% as compared to males who graduated at a rate of 25.5%.

Ready Graduate Tennessee Program

The Ready Graduate indicator in Tennessee began in 2018 as a method of accountability for school systems under the state's Every Student Succeeds Act (ESSA). According to this indicator, which is aligned to the Tennessee Department of Education's strategic plan, the student success of high school graduates is measured by specific criteria regarding post-secondary education and subsequent employment status. According to the Tennessee Department of Education (2018), the Ready Graduate indicator measured the percentage of students who

earned a diploma from a Tennessee high school and met success milestones that increased their probability of seamlessly enrolling in postsecondary education and securing high-quality employment.

The implementation of the Ready Graduate indicator in Tennessee requires school systems to provide robust EPSO offerings and continue to improve access to those courses. Fall 2020 saw all school systems in the state held accountable to the same metrics for evaluating the post-secondary readiness of graduates. Those metrics include the percentage of graduates earning a composite score of 21 or higher on the ACT or a 1060 or higher on the SAT; the percentage of graduates completing at least four EPSOs; the percentage of graduates completing at least two EPSOs while also earning an industry certification; the percentage of graduates completing two EPSOs while also earning a score of 31 on the Armed Services Vocational Aptitude Battery (ASVAB) and Armed Forces Qualifying Test (AFQT); and the percentage of graduates completing at least two EPSOs while also earning a WorkKeys National Career Readiness Certificate (TDOE, 2017a).

Because Tennessee continued to emphasize attainment of post-secondary degrees and industry certifications, EPSOs have been emphasized as a proven tool to increase student success. The Drive to 55 initiative in Tennessee was designed to raise the percentage of Tennessee's population with either a college credential or certification to 55 % by 2025 (Tennessee Department of Education, 2017b).

Chapter 3. Research Method

The ability of local education agencies (LEAs) and community colleges to create access and exposure to early postsecondary opportunities (EPSOs) has proven beneficial to student success in certain studies across the country (An & Taylor, 2015; Fink et al., 2017; Grubb et al., 2017; Prophete, 2013; Speroni, 2011; Struhl & Vargas, 2012). Research regarding dual enrollment in particular has discovered differences in student success in various demographic sectors such as gender, race, and socio-economic status (Barnett & Stamm, 2010; Hoffman et al., 2009). In those studies, retention and completion rates were better for students who engaged in dual enrollment courses in comparison with their peers who had not. Access to dual enrollment has been accomplished through college coursework offered on high school campuses, early college programs, and other formats that emerged from partnerships between LEAs and community colleges. LEAs focused on preparing students for postsecondary life, while community colleges constantly sought strategies to retain students while also helping them complete degree programs (Adelman, 2006; An & Taylor, 2015; Attewell & Domina, 2008; Taylor, 2015).

Success measures for school districts included preparing students for post-secondary life while success for community colleges is measured by graduation and retention rates. Successful dual enrollment partnerships assisted in justifying and securing adequate funding for continued work and progress toward increasing student success. Recent incentives to increase community college attendance and persistence, including the Drive for 55 and Tennessee Promise Initiatives, have heightened the importance of collaboration between local school districts and local community colleges (Tennessee Department of Education, 2017b; Tennessee Department of Education 2017c).

State government's desire to encourage more citizens of Tennessee to attend and to persist at higher education institutions through recent initiatives coincided with the Tennessee Department of Education's actions to increase access and exposure to EPSOs for high school students. Tennessee has increased its focus on dual enrollment as an influential factor regarding student success in post-secondary settings. This was evident in the state's Ready Graduate Indicator User Guide, which addressed student EPSO completion in three of the four possible criteria (Tennessee Department of Education, 2020). According to the Tennessee Department of Education (2020):

All students who graduate with a regular education diploma, including those with Individualized Education Programs (IEPs), are included in the Ready Graduate Indicator if they: score at least a 21 or higher on the ACT (or 1060 or higher on the SAT; or complete four EPSOs; or complete two EPSOs and earn an industry credential; or complete 2 EPSOs and earn a score of military readiness on ASVAB AFQT. (p. 3)

At the time of this study, dual enrollment was the most popular EPSO offered by high schools in Tennessee, with 77% offering at least one dual enrollment option (Tennessee Department of Education, 2017a).

This non-experimental, quantitative, comparative study was designed to determine if there are significant differences in fall-to-fall retention and graduation rates, between first-time, full-time students who engaged in at least one early post-secondary opportunity (EPSO) while in high school and those who did not. In addition, gender, Pell eligibility, and at-risk status were considered. Findings may be beneficial in determining whether dual enrollment offerings are beneficial to student success outcomes as measured by fall-to-fall retention and graduation rates at the participating community college.

Research Questions and Null Hypotheses

The research questions of this study were intended to determine whether engagement in early post-secondary opportunities (EPSOs) has a relationship to graduation rates and fall-to-fall retentions rates for first-time, full-time students at the participating community college. For each of the research questions only community college students who graduated from the participating, urban, K-12 public school system were included in the analyses. More specifically, the following research questions were investigated.

Research Question 1

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

H₀1: There is not a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 2

Is there a significant difference in the mean number of dual enrollment EPSOs between students who graduated within 3 years and students who did not graduate within 3 years at the participating community college?

H₀2: There is not a significant difference in the mean number of dual enrollment EPSOs between students who graduated within 3 years and students who did not graduate within 3 years at the participating community college.

Research Question 3

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by gender?

H₀₃₁: There is not a significant difference in the proportion of female students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

H₀₃₂: There is not a significant difference in the proportion of male students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 4

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by Pell eligibility status?

H₀₄₁: There is not a significant difference in the proportion of Pell eligible students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

H₀₄₂: There is not a significant difference in the proportion of non-Pell eligible students who graduated within 3 years at the participating community college between students

who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 5

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participated in an EPSO by at-risk status?

H₀5₁: There is not a significant difference in the proportion of students designated as at-risk who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

H₀5₂: There is not a significant difference in the proportion of students not designated as at-risk who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 6

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participated in an EPSO?

H₀6: There is not a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between

students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in and EPSO.

Research Question 7

Is there a significant difference in the mean number of dual enrollment EPSOs between first-time, full-time, students who were retained fall-to-fall and students who were not retained at the participating community college?

H₀7: There is not a significant difference in the mean number of dual enrollment EPSOs between first-time, full-time, students who were retained fall-to-fall and students who were not retained at the participating community college.

Research Question 8

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by gender?

H₀8₁: There is not a significant difference in the proportion of first-time, full-time, female students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

H₀8₂: There is not a significant difference in the proportion of first-time, full-time, male students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 9

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by Pell eligibility status?

H₀₉₁: There is not a significant difference in the proportion of first-time, full-time, Pell eligible students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

H₀₉₂: There is not a significant difference in the proportion of first-time, full-time, non-Pell eligible students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 10

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between those students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO at-risk status?

H₀₁₀₁: There is not a significant difference in the proportion of first-time, full-time, students designated as at-risk who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

H₀10₂: There is not a significant difference in the proportion of first-time, full-time, students not designated as at-risk who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 11

Is there a significant difference in the proportion of students who graduated within 2 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

H₀11: There is not a significant difference in the proportion of students who graduated within 2 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

Research Question 12

Is there a significant difference in the number of dual enrollment EPSOs between students who graduated within 2 years and students who did not graduate within 2 years at the participating community college?

H₀12: There is not a significant difference in the number of dual enrollment EPSOs between students who graduated within 2 years and students who did not graduate within 2 years at the participating community college.

Instrumentation

The instrument for data collection for my study was an archival database housed at the participating community college. Because of the nature of this secure database it was considered valid and reliable. The data were transmitted to me by email in an encrypted Microsoft Excel

file. Because on de-identified archival data were used in this study none of the students who were included in data set were aware of being included and I did not receive any identifying information.

Population

The population for my study included all students who graduated from one county school system in 2016, 2017, or 2018 and then enrolled as first-time, full-time students at the local community college. Students were divided into two groups; those that participated in an early postsecondary opportunity (EPSO) while in school and those that did not participate. The resulting population for this study was 2,911. For the population 622 students participated in at least on EPSO and 2,289 did not participate in an EPSO during their high school careers.

Data Collection

Data for my study were stored in a secure database through the BANNER system located at the participating community college. Before the data were received I completed the required Institutional Review Board (IRB) forms at East Tennessee State University. After ETSU's IRB approval, I then requested the data from the Office of Institutional Effectiveness, Research and Planning at the community college. Data collected for this study included all students who graduated from one county school system in Tennessee in 2015-16, 2016-17, and 2017-18 and subsequently enrolled at the participating community college. The data were de-identified by the community college and contained no personally identifiable information.

Data Analysis

Chi-square tests using a two-way contingency table with cross tabs or independent sample t-tests were used to evaluate each of the research questions. Chi-square independence tests are used to determine if two variables are likely to be related. Statistical software (IBM-

SPSS) was used for the purpose of data analyses presented in this study. Research questions 1, 3, 4, 5, 6, 8, 9, 10, and 11 were analyzed using two-way contingency tables with crosstabs. Questions 2, 7, and 12 were analyzed using independent sample t-tests to explore whether significant relationships existed among the following variables:

- Graduation rates between participants who completed a dual enrollment course and those who did not.
- Graduation rates of male participants between those who completed dual enrollment courses and those who did not.
- Graduation rates of female participants between those who completed dual enrollment courses and those who did not.
- Graduation rates and the socio-economic status (Pell eligibility) of participants between those who completed dual enrollment courses and those who did not.
- Graduation rates and the at-risk status (ACT 17 or below) of participants between those who completed dual enrollment courses and those who did not.
- Fall-to-fall retention rates of male participants who completed a dual enrollment course and those who did not.
- Fall-to-fall retention rates of female participants between those who completed dual enrollment courses and those who did not.
- Fall-to-fall retention rates and the socio-economic status (Pell eligibility) of participants between those who completed dual enrollment courses and those who did not.
- Fall-to-fall retention rates and at-risk status (ACT 17 or below) of participants between those who completed dual enrollment courses and those who did not.

Research question 2 was analyzed using independent-samples t tests to determine the relationship of dual enrollment to the following category:

- Graduation rates between participants and mean number of dual enrollment courses taken.

Research questions 10 and 11 were analyzed using independent-samples t tests to compare the means of dual enrollment participants and non-dual enrollment participants for the following categories:

- Graduation rates between participants who completed one dual enrollment course and those who completed more than one dual enrollment course.
- Fall-to-fall retention rates between participants who completed one dual enrollment course and those who completed more than one dual enrollment course.

All data were analyzed at the .05 level of significance.

Chapter 4. Findings

This non-experimental, quantitative, comparative study was designed to determine if there are significant differences in fall-to-fall retention and graduation rates, between first-time, full-time students who engaged in at least one early post-secondary opportunity (EPSO) while in high school and those who did not. In addition, gender, Pell eligibility, and at-risk status were considered. Included in this chapter are the data analyses and findings for each of the research questions.

Archival data for this study were collected at the participating community college between 2015 and 2018. Dual enrollment and non-dual enrollment students enrolled in academic programs at the community college were chosen. The period of time was chosen to allow for students to complete a program of study as full-time students after high school graduation. Data were requested and obtained from the Office of Institutional Effectiveness, Research, and Planning (IERP) at the participating community college to identify participants who had completed dual enrollment coursework and were enrolled at the participating community college between 2015 and 2018. Archival data available through the participating community college's IERP office included retention rates and graduation rates among students who participated in EPSOs (N = 622) and students who did not participate in EPSOs (N = 2289). Other data collected for each participant included: (a) socio-economic status as determined by Pell eligibility, (b) at-risk status as determined by an ACT score of 17 or below, and (c) gender.

Table 1 details the academic progress of the studied cohort of students. Of the 2,911 first-time, full-time, students enrolled at the participating community college during the aforementioned period, 2,289 of those students had not participated in EPSOs (78.6% of the cohort) and graduated at a rate of 15.2%. Of the 2,911 first-time, full-time, students enrolled at

the participating community college, 622 of those students had participated in EPSOs (21.3% of the cohort) and graduated at a rate of 37.8%. The overall 3-year graduation rate of the cohort was 19.7% (573/2911).

Table 1

3-Year Graduation Rates by Number of EPSOs (Dual Enrollment, AP, or IB) Completed

EPSO	N	Percent of Population	Percent Graduated
0	2289	78.6	15.2
1	165	5.6	20.0
3 or more	319	10.9	45.5
5 or more	138	4.7	47.8

Chi-square tests using a two-way contingency table with crosstabs or independent sample t-tests were used to evaluate each of the research questions. Two-way contingency tables analyses were used to determine if there were significant relationships between participation in early postsecondary opportunities and retention and graduation rates regarding gender, Pell eligibility, and at-risk status. Independent-samples t tests were conducted to determine if significant relationships existed between participation in early postsecondary opportunities and 3-year graduation rates, 2-year graduation rates, and fall-to-fall retention rates.

Analyses of Research Questions

Research Question 1

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

H₀1: There is not a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether students who participated in one or more EPSOs graduated within 3 years at significantly different rates than students who did not participate in one or more EPSOs. The two variables were graduation within 3 years (yes or no) and participation in one or more EPSOs (yes or no). EPSO participation and graduation within 3 years were found to be significantly related, Pearson $\chi^2(1, N = 2911) = 126.22, p < .001, \text{Cramer's } V = .21$. Therefore, the null hypothesis was rejected. The overall 3-year graduation rate for the participating community college was 19.7% during the study period. The graduation rate for students who participated in one or more EPSOs was 33.7% compared to a 3-year graduation rate of 14.8% for students who did not participate in EPSOs. Students who participated in one or more EPSOs were significantly more likely to graduate within 3 years than students who did not participate in EPSOs.

Research Question 2

Is there a significant difference in the mean number of dual enrollment EPSOs between students who graduated within 3 years and students who did not graduate within 3 years at the participating community college?

H₀2: There is not a significant difference in the mean number of dual enrollment EPSOs between students who graduated within 3 years and students who did not graduate within 3 years at the participating community college.

An independent-samples t test was conducted to evaluate whether the mean number of EPSO courses taken by students who graduated within 3 years differed significantly from the mean number of EPSO courses taken by students who did not graduate within 3 years at the participating community college. Students' number of EPSOs taken was the test variable, and the grouping variable was 3-year graduation status (yes or no). The test was significant, $t(2911) = 12.99$, $p < .001$. Therefore, null hypothesis H_{02} was rejected. The effect size for this analysis indicated a medium effect size ($d = .61$). The 95% confidence interval for the difference in means was 1.5 to 1.43. Students who graduated in 3 years had a significantly higher mean number of EPSOs than students who did not graduate in 3 years (see Table 2).

Table 2

3-Year Graduation Rates by EPSO Participation

Graduated in 3 Years	N	M	SD
Yes	563	1.76	3.30
No	2348	.52	1.61

Research Question 3

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by gender?

H_{031} : There is not a significant difference in the proportion of female students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether female students who participated in one or more EPSOs graduated within 3 years at significantly different rates than female students who did not participate in one or more EPSOs. The two variables were graduation within 3 years (yes or no) and participation in one or more EPSOs (yes or no). For females, EPSO participation and graduation within 3 years were found to be significantly related, Pearson $\chi^2(1, N = 1579) = 79.74, p < .001$, Cramer's $V = .22$. Therefore, null hypothesis H_{031} was rejected. The 3-year graduation rate for female students who participated in one or more EPSOs was 35.4% compared to a 3-year graduation rate of 15.1% for female students who did not participate in EPSOs. Female students who participated in one or more EPSOs were significantly more likely to graduate within 3 years than female students who did not participate in EPSOs.

H_{032} : There is not a significant difference in the proportion of male students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether male students who participated in one or more EPSOs graduated within 3 years at significantly different rates than male students who did not participate in one or more EPSOs. The two variables were graduation within 3 years (yes or no) and participation in one or more EPSOs (yes or no). For males, EPSO participation and graduation within 3 years were found to be significantly related, Pearson $\chi^2(1, N = 1332) = 44.48, p < .001$, Cramer's $V = .18$. Therefore, null hypothesis H_{032} was rejected. The 3-year graduation rate for male students who participated in one or more EPSOs was 31.3% compared to a 3-year graduation rate of 14.4% for male

students who did not participate in EPSOs. Male students who participated in one or more EPSOs were significantly more likely to graduate within 3 years than male students who did not participate in EPSOs.

Research Question 4

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by Pell eligibility status?

H_{04_1} : There is not a significant difference in the proportion of Pell eligible students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether Pell eligible students who participated in one or more EPSOs graduated within 3 years at significantly different rates than Pell eligible students who did not participate in one or more EPSOs. The two variables were graduation within 3 years (yes or no) and participation in one or more EPSOs (yes or no). For Pell eligible students, EPSO participation and graduation within 3 years were found to be significantly related, Pearson $\chi^2(1, N = 1739) = 54.62, p < .001$, Cramer's $V = .18$. Therefore, null hypothesis H_{04_1} was rejected. The 3-year graduation rate for Pell eligible students who participated in one or more EPSOs was 27.4% compared to a 3-year graduation rate of 11.6% for Pell eligible students who did not participate in EPSOs. Pell eligible students who participated in one or more EPSOs were significantly more likely to graduate within 3 years than Pell eligible students who did not participate in EPSOs.

H₀₄₂: There is not a significant difference in the proportion of non-Pell eligible students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether non-Pell eligible students who participated in one or more EPSOs graduated within 3 years at significantly different rates than non-Pell eligible students who did not participate in one or more EPSOs. The two variables were graduation within 3 years (yes or no) and participation in one or more EPSOs (yes or no). For non-Pell eligible students, EPSO participation and graduation within 3 years were found to be significantly related, Pearson $\chi^2(1, N = 1172) = 45.45, p < .001$, Cramer's $V = .20$. Therefore, null hypothesis H₀₄₂ was rejected. The 3-year graduation rate for non-Pell eligible students who participated in one or more EPSOs was 39.1% compared to a 3-year graduation rate of 20.7% for non-Pell eligible students who did not participate in EPSOs. Non-Pell eligible students who participated in one or more EPSOs were significantly more likely to graduate within 3 years than non-Pell eligible students who did not participate in EPSOs.

Research Question 5

Is there a significant difference in the proportion of students who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participated in an EPSO by at-risk status?

H₀₅₁: There is not a significant difference in the proportion of students designated as at-risk who graduated within 3 years at the participating community college between

students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether students designated as at-risk who participated in one or more EPSOs graduated within 3 years at significantly different rates than students designated as at-risk who did not participate in one or more EPSOs. The two variables were graduation within 3 years (yes or no) and participation in one or more EPSOs (yes or no). For students designated as at-risk, EPSO participation and graduation within 3 years were found to be significantly related, Pearson $\chi^2(1, N = 2021) = 68.15, p < .001$, Cramer's $V = .18$. Therefore, null hypothesis H_{051} was rejected. The 3-year graduation rate for at-risk students who participated in one or more EPSOs was 30.3% compared to a 3-year graduation rate of 12.6% for at-risk students who did not participate in EPSOs. Students designated as at-risk who participated in one or more EPSOs were significantly more likely to graduate within 3 years than students designated as at-risk who did not participate in EPSOs.

H_{052} : There is not a significant difference in the proportion of students not designated as at-risk who graduated within 3 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis was conducted to evaluate whether students not designated as at-risk who participated in one or more EPSOs graduated within 3 years at significantly different rates than students not designated as at-risk who did not participate in one or more EPSOs. The two variables were graduation within 3 years (yes or no) and participation in one or more EPSOs (yes or no). For students not designated as at-risk, EPSO participation and

graduation within 3 years were found to be significantly related, Pearson $\chi^2(1, N = 890) = 22.72$, $p < .001$, Cramer's $V = .16$. Therefore, null hypothesis H_{052} was rejected. The 3-year graduation rate for not at-risk students who participated in one or more EPSOs was 36.7% compared to a 3-year graduation rate of 22.2% for not at-risk students who did not participate in EPSOs. Students not designated as at-risk who participated in one or more EPSOs were significantly more likely to graduate within 3 years than students not designated as at-risk who did not participate in EPSOs.

Research Question 6

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

H_{06} : There is not a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in and EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether first-time, full-time, students who participated in one or more EPSOs were retained fall-to-fall at significantly different rates than first-time, full-time, students who did not participate in one or more EPSOs. The two variables were fall-to-fall retention (yes or no) and participation in one or more EPSOs (yes or no). For first-time, full-time, students, EPSO participation and fall-to-fall retention were found to be significantly related, Pearson $\chi^2(1, N = 2911) = 41.64$, $p < .001$, Cramer's $V = .12$. Therefore, null hypothesis H_{06} was rejected. The overall fall-to-fall retention

rate for the participating community college was 46.8% during the study period. The fall-to-fall retention rate for students who participated in one or more EPSOs was 57.0% compared to a fall-to-fall retention rate of 43.0% for students who did not participate in EPSOs. First-time, full-time, students who participated in one or more EPSOs were significantly more likely to be retained than first-time, full-time, students who did not participate in EPSOs.

Research Question 7

Is there a significant difference in the mean number of dual enrollment EPSOs between first-time, full-time, students who were retained fall-to-fall and students who were not retained at the participating community college?

H₀7: There is not a significant difference in the mean number of dual enrollment EPSOs between first-time, full-time, students who were retained fall-to-fall and students who were not retained at the participating community college.

An independent-samples t test was conducted to evaluate whether the mean number of EPSO courses taken by first-time, full-time students who were retained differed significantly from the mean number of EPSO courses taken by first-time, full-time, students who were not retained at the participating community college. Students' number of EPSOs taken was the test variable, and the grouping variable was fall-to-fall retention (yes or no). The test was significant, $t(2911) = 5.48$, $p < .001$. Therefore, H₀7 was rejected. The effect size for this analysis indicated a small effect size ($d = .20$). The 95% confidence interval for the difference in means was .27 to .58. Students who participated in one or more EPSOs were significantly more likely to be retained fall-to-fall than students who did not participate in EPSOs (see Table 3).

Table 3*Fall-to-Fall Retention Rate by EPSO Participation*

Fall-to-Fall Retention	N	M	SD
Yes	1367	.99	2.34
No	1544	.57	1.86

Research Question 8

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by gender?

H₀₈₁: There is not a significant difference in the proportion of first-time, full-time, female students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether first-time, full-time, female students who participated in one or more EPSOs were retained at significantly different rates than first-time, full-time, female students who did not participate in one or more EPSOs. The two variables were fall-to-fall retention (yes or no) and participation in one or more EPSOs (yes or no). For first-time, full-time, female students, EPSO participation and fall-to-fall retention were found to be significantly related, Pearson $\chi^2(1, N = 1579) = 26.48$, $p < .001$, Cramer's $V = .13$. Therefore, null hypothesis H₀₈₁ was rejected. The fall-to-fall retention rate for female students who participated in one or more EPSOs was 59.0% compared

to a fall-to-fall retention rate of 41.0% for female students who did not participate in EPSOs. First-time, full-time, female students who participated in one or more EPSOs were significantly more likely to be retained than first-time, full-time, female students who did not participate in EPSOs.

H₀₈₂: There is not a significant difference in the proportion of first-time, full-time, male students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether first-time, full-time, male students who participated in one or more EPSOs were retained at significantly different rates than first-time, full-time, male students who did not participate in one or more EPSOs. The two variables were fall-to-fall retention (yes or no) and participation in one or more EPSOs (yes or no). For first-time, full-time, male students, EPSO participation and fall-to-fall retention were found to be significantly related, Pearson $\chi^2(1, N = 1332) = 13.86, p < .001$, Cramer's $V = .10$. Therefore, null hypothesis H₀₈₂ was rejected. The fall-to-fall retention rate for male students who participated in one or more EPSOs was 54.0% compared to a fall-to-fall retention rate of 46.0% for male students who did not participate in EPSOs. First-time, full-time, male students who participated in one or more EPSOs were significantly more likely to be retained than first-time, full-time, male students who did not participate in EPSOs.

Research Question 9

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who

participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by Pell eligibility status?

H₀9₁: There is not a significant difference in the proportion of first-time, full-time, Pell eligible students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether Pell eligible students who participated in one or more EPSOs were retained at significantly different rates than Pell eligible students who did not participate in one or more EPSOs. The two variables were fall-to-fall retention (yes or no) and participation in one or more EPSOs (yes or no). For Pell eligible students, EPSO participation and fall-to-fall retention were found to be significantly related, Pearson $\chi^2(1, N = 1739) = 31.33, p < .001$, Cramer's $V = .13$. Therefore, null hypothesis H₀9₁ was rejected. The fall-to-fall retention rate for Pell eligible students who participated in one or more EPSOs was 55.3% compared to a fall-to-fall retention rate of 38.6% for Pell eligible students who did not participate in EPSOs. Pell eligible students who participated in one or more EPSOs were significantly more likely to be retained than Pell eligible students who did not participate in EPSOs.

H₀9₂: There is not a significant difference in the proportion of first-time, full-time, non-Pell eligible students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether non-Pell eligible students who participated in one or more EPSOs were retained at significantly different rates than non-Pell eligible students who did not participate in one or more EPSOs. The two variables were fall-to-fall retention (yes or no) and participation in one or more EPSOs (yes or no). For non-Pell eligible students, EPSO participation and fall-to-fall retention were found to be significantly related, Pearson $\chi^2(1, N = 1172) = 4.54, p < .035$, Cramer's $V = .06$. Therefore, null hypothesis H_{09_2} was rejected. The fall-to-fall retention rate for non-Pell eligible students who participated in one or more EPSOs was 58.4% compared to a fall-to-fall retention rate of 52.0% for non-Pell eligible students who did not participate in EPSOs. Non-Pell eligible students who participated in one or more EPSOs were significantly more likely to be retained than non-Pell eligible students who did not participate in EPSOs.

Research Question 10

Is there a significant difference in the proportion of first-time, full-time, students who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO by at-risk status?

H_{010_1} : There is not a significant difference in the proportion of first-time, full-time, students designated as at-risk who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether students designated as at-risk who participated in one or more EPSOs were retained at significantly different rates than students designated as at-risk who did not participate in one or

more EPSOs. The two variables were fall-to-fall retention (yes or no) and participation in one or more EPSOs (yes or no). For students designated as at-risk, EPSO participation and fall-to-fall retention were found to be significantly related, Pearson $\chi^2(1, N = 2021) = 26.87, p < .001$, Cramer's $V = .12$. Therefore, null hypothesis H_{010_1} was rejected. The fall-to-fall retention rate for at-risk students who participated in one or more EPSOs was 57.2% compared to a fall-to-fall retention rate or 42.0% for at-risk students who did not participate in EPSOs. Students designated as at-risk who participated in one or more EPSOs were significantly more likely to be retained than students designated as at-risk who did not participate in EPSOs.

H_{010_2} : There is not a significant difference in the proportion of first-time, full-time, students not designated as at-risk who were retained fall-to-fall at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether students not designated as at-risk who participated in one or more EPSOs were retained at significantly different rates than students not designated as at-risk who did not participate in one or more EPSOs. The two variables were fall-to-fall retention (yes or no) and participation in one or more EPSOs (yes or no). For students designated as not at-risk, EPSO participation and fall-to-fall retention were found to be significantly related, Pearson $\chi^2(1, N = 890) = 7.17, p < .007$, Cramer's $V = .09$. Therefore, null hypothesis H_{010_2} was rejected. The fall-to-fall retention rate for not at-risk students who participated in one or more EPSOs was 56.8% compared to a fall-to-fall retention rate of 47.8% for not at-risk students who did not participate in EPSOs. Students not designated as at-risk who participated in one or more EPSOs were significantly more likely to be retained than students not designated as at-risk who did not participate in EPSOs.

Research Question 11

Is there a significant difference in the proportion of students who graduated within 2 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO?

H₀11: There is not a significant difference in the proportion of students who graduated within 2 years at the participating community college between students who participated in one or more EPSOs (dual enrollment, AP, or IB) and students who did not participate in an EPSO.

A two-way contingency table analysis using crosstabs was conducted to evaluate whether students who participated in one or more EPSOs graduated within 2 years at significantly different rates than students who did not participated in one or more EPSOs. The two variables were graduation within 2 years (yes or no) and participation in one or more EPSOs (yes or no). EPSO participation and graduation within 2 years were found to be significantly related, Pearson $\chi^2(1, N = 2911) = 139.70, p < .001, \text{Cramer's } V = .22$. Therefore, the null the null hypothesis was rejected. The overall 2-year graduation rate for the participating community college was 10.1% during the study period. The 2-year graduation rate for students who participated in one or more EPSOs was 21.4% compared to a 2-year graduation rate of 6.2% for students who did not participate in EPSOs. Students who participated in one or more EPSOs were significantly more likely to graduate within 2 years than students who did not participate in EPSOs.

Research Question 12

Is there a significant difference in the number of dual enrollment EPSOs between students who graduated within 2 years and students who did not graduate within 2 years at the participating community college?

H₀12: There is not a significant difference in the number of dual enrollment EPSOs between students who graduated within 2 years and students who did not graduate within 2 years at the participating community college.

An independent-samples t test was conducted to evaluate whether the mean number of EPSO courses taken by students who graduated within 2 years differed significantly from the mean number of EPSO courses taken by students who did not graduate within 2 years at the participating community college. Students' number of EPSOs taken was the test variable, and the grouping variable was 2-year graduation status (yes or no). The test was significant, $t(2911) = 15.90$, $p < .001$. Therefore, H₀12 was rejected. The effect size for this analysis indicated a large effect size ($d = .98$). The 95% confidence interval for the difference in means was 1.73 to 2.22. The overall 2-year graduation rate for the participating community college was 10.1% during the study period. The 2-year graduation rate for students who participated in one or more EPSOs was 24.1% compared to a 2-year graduation rate of 6.2% for students who did not participate in EPSOs. Students who graduated in 2 years had a significantly higher mean number of EPSOs than students who did not graduate in 2 years (see Table 4).

Table 4

2-Year Graduation Rates by EPSO Participation

Graduated in 2 Years	N	M	SD
Yes	295	2.54	4.07
No	2616	.57	1.64

Chapter 5. Discussion, Conclusions, and Recommendations

The purpose of this non-experimental, quantitative, comparative study was to compare retention and graduation rates of students who participated in early postsecondary opportunities (EPSOs) prior to enrolling at a Tennessee community college versus students who did not participate in EPSOs prior to enrolling. I analyzed enrollment and graduation data from the participating college's student records database. For the analyses of retention and graduation, students were categorized as EPSO participants or EPSO nonparticipants. Findings from this study could contribute to the existing body of knowledge as to whether high school participation in EPSOs is associated with improved retention and graduation rates at community colleges.

Discussion

Three-year graduation rates of EPSO participants and nonparticipants were addressed in Research Questions 1, 2, 3, 4, and 5. Research Question 1 addressed the 3-year graduation rate among students who participated in one or more EPSOs and students who did not participate. Three-year graduation rates were significantly higher among students who participated in one or more EPSOs than students who did not participate in one or more EPSOs ($p < .001$). The 3-year graduation rate for students who participated in one or more EPSOs was 33.7% compared to a 3-year graduation rate of 14.8% for students who did not participate in EPSOs. These findings support other studies that revealed improved completion rates among students who engaged in EPSOs (Barnett & Stamm, 2010; Hoffman et al., 2009).

Research Question 2 addressed the 3-year graduation rate and the mean number of EPSOs taken by students. I specifically sought to determine if the mean number of EPSO courses taken by students who graduated within 3 years differed significantly from the mean number of EPSO courses taken by students who did not graduate within 3 years. There was a significant

difference ($p < .001$) as students who graduated in 3 years had a significantly higher mean number of EPSOs ($M = 1.76$) than students who did not graduate in 3 years ($M = .52$).

For Research Question 3, between female EPSO participants and female nonparticipants and between male EPSO participants and male nonparticipants. Three-year graduation rates were significantly higher among female students who participated in one or more EPSOs than female students who did not participate in one or more EPSOs ($p < .001$). The 3-year graduation rate for female students who participated in one or more EPSOs was 35.4% compared to a 3-year graduation rate of 15.1% for female students who did not participate in EPSOs. Three-year graduation rates were also significantly higher among male students who participated in one or more EPSOs than male students who did not participate in one or more EPSOs ($p < .001$). The 3-year graduation rate for male students who participated in one or more EPSOs was 31.3% compared to a 3-year graduation rate of 14.4% for male students who did not participate in EPSOs. Previous findings regarding the relationship of gender to academic outcomes was largely inconclusive. Karp and Hughes' 2008 findings indicated no significant outcome differences by gender. However, Ganzert's 2012 findings demonstrated gender differences with female students who had participated in dual enrollment graduating at a higher rate than male students who had participated in dual enrollment.

For Research Question 4, I disaggregated the data based on Pell eligibility to determine if there were differences in 3-year graduation rates between Pell eligible EPSO participants and Pell eligible nonparticipants and non-Pell eligible participants and non-Pell eligible nonparticipants. The 3-year graduation rates were significantly higher among Pell eligible students who participated in one or more EPSOs than Pell eligible students who did not participate in one or more EPSOs ($p < .001$). The 3-year graduation rate for Pell eligible students

who participated in one or more EPSOs was 27.4% compared to a 3-year graduation rate of 11.6% for Pell eligible students who did not participate in EPSOs. Three-year graduation rates were significantly higher among non-Pell eligible students who participated in one or more EPSOs than non-Pell eligible students who did not participate in one or more EPSOs ($p < .001$). The 3-year graduation rate for non-Pell eligible students who participated in one or more EPSOs was 39.1% compared to a 3-year graduation rate of 20.7% for non-Pell eligible students who did not participate in EPSOs. Socioeconomic status (SES) has long been viewed as a determining factor in academic outcomes. Students who come from high SES backgrounds were more likely to take more academically rigorous coursework, enroll in postsecondary educational institutions, and eventually earn a degree (Adelman, 2006, An, 2013b; Attewell & Domina, 2008; Haveman & Wilson, 2007; Taylor, 2015). Students who come from low SES backgrounds are less frequently enrolled in EPSOs and had fewer opportunities for exposure (An, 2013b). The Pell eligibility-based findings in my research were consistent with other studies concerning retention and graduation rates of students from both high and low SES backgrounds in terms of retention and graduation.

Research Question 5 addressed at-risk status to determine if there were differences in 3-year graduation rates among students designated as at-risk who were EPSO participants and students designated as at-risk who were EPSO nonparticipants and students not designated as at-risk who were EPSO participants and students not designated as at-risk who were EPSO nonparticipants. The 3-year graduation rates were significantly higher among students designated as at-risk who participated in one or more EPSOs than students designated as at-risk who did not participate in one or more EPSOs ($p < .001$). The 3-year graduation rate for at-risk students who participated in one or more EPSOs was 30.3% compared to a 3-year graduation rate of 12.6% for

at-risk students who did not participate in EPSOs. The 3-year graduation rates were significantly higher among students not designated as at-risk who participated in one or more EPSOs than students not designated as at-risk who did not participate in one or more EPSOs ($p < .001$). The 3-year graduation rate for students not at-risk who participated in one or more EPSOs was 36.7% compared to a 3-year graduation rate of 22.2% for not at-risk students who did not participate in EPSOs. These findings support the growing interest in leveraging dual enrollment as a tool for use with students other than those seen as being traditionally college-bound (Barnett & Stamm, 2010). A side benefit to EPSOs being utilized as a way to provide better preparation for postsecondary success resided in the ability to encourage individuals to envision themselves as successful college students (Hoffman et al., 2009).

The fall-to-fall retention rates of first-time, full-time, students were addressed in Research Questions 6, 7, 8, 9, and 10. Research Question 6 addressed the fall-to-fall retention rate among first-time, full-time, students who did and did not participate in one or more EPSOs. Retention rates were significantly higher among students who participated in one or more EPSOs than students who did not participate in one or more EPSOs ($p < .001$). The fall-to-fall retention rate for students who participated in one or more EPSOs was 57.0% compared to a fall-to-fall retention rate of 43.0% for students who did not participate in EPSOs.

Research Question 7 addressed the fall-to-fall retention rate and the mean number of EPSOs taken by students. I specifically sought to determine if the mean number of EPSO courses taken by first-time, full-time, students who were retained fall-to-fall differed significantly from the mean number of EPSO courses taken by first-time, full-time students who were not retained fall-to-fall. There was a significant difference ($p < .001$) as students who were retained fall-to-fall had a significantly higher mean number of EPSOs ($M = .99$) than students who were not

retained fall-to-fall ($M = .57$). The fall-to-fall retention rate for students who participated in one or more EPSOs was 57.0% compared to a fall-to-fall retention rate of 43.0% for students who did not participate in EPSOs.

Research Question 8 was designed to determine if there were significant differences in fall-to-fall retention rates between first-time, full-time, female EPSO participants and female nonparticipants and between first-time, full-time male EPSO participants and male nonparticipants. Fall-to-fall retention rates were significantly higher among first-time, full-time, female students who participated in one or more EPSOs than first-time, full-time, female students who did not participate in one or more EPSOs ($p < .001$). The fall-to-fall retention rate for female students who participated in one or more EPSOs was 59.0% compared to a fall-to-fall retention rate of 41.0% for female students who did not participate in EPSOs. Fall-to-fall retention rates were also significantly higher among first-time, full-time, male students who participated in one or more EPSOs than first-time, full-time, male students who did not participate in one or more EPSOs ($p < .001$). The fall-to-fall retention rate for male students who participated in one or more EPSOs was 54.0% compared to a fall-to-fall retention rate of 46.0% for male students who did not participate in EPSOs.

Research Question 9 was designed to determine if there were differences in fall-to-fall retention rates between first-time, full-time, Pell eligible EPSO participants and Pell eligible nonparticipants and between first-time, full-time, non-Pell eligible participants and non-Pell eligible nonparticipants. Fall-to-fall retention rates were significantly higher among first-time, full-time, Pell eligible students who participated in one or more EPSOs than first-time, full-time, Pell eligible students who did not participate in one or more EPSOs ($p < .001$). The fall-to-fall retention rate for Pell eligible students who participated in one or more EPSOs was 55.3%

compared to a fall-to-fall retention rate of 38.6% for Pell eligible students who did not participate in EPSOs. While the literature was not robust concerning the success rates and EPSO participation of students from low SES backgrounds, my study aligns with previous literature anticipating improved persistence and completion measures for students (Taylor, 2015). Fall-to-fall retention rates were also significantly higher among first-time, full-time, non-Pell eligible students who participated in one or more EPSOs than first-time, full-time, non-Pell eligible students who did not participate in one or more EPSOs ($p < .035$). The fall-to-fall retention rate for non-Pell eligible students who participated in one or more EPSOs was 58.4% compared to a fall-to-fall retention rate of 52.0% for non-Pell eligible students who did not participate in EPSOs. These findings supported the literature concerning students from high SES backgrounds in terms of persistence (Taylor, 2015).

For Research Question 10, I disaggregated the data based on at-risk status to determine if there were differences in fall-to-fall retention rates among first-time, full-time, students designated as at-risk who were EPSO participants and students designated as at-risk who were EPSO nonparticipants and first-time, full-time, students not designated as at-risk who were EPSO participants and students not designated as at-risk who were EPSO nonparticipants. Fall-to-fall retention rates were significantly higher among first-time, full-time, students designated as at-risk who participated in one or more EPSOs than first-time, full-time, students designated as at-risk who did not participate in one or more EPSOs ($p < .001$). The fall-to-fall retention rate for at-risk students who participated in one or more EPSOs was 57.2% compared to a fall-to-fall retention rate of 42.0% for at-risk students who did not participate in EPSOs. Fall-to-fall retention rates were significantly higher among first-time, full-time, students not designated as at-risk who participated in one or more EPSOs than first-time, full-time, students not designated

as at-risk who did not participate in one or more EPSOs ($p < .007$). The fall-to-fall retention rate for not at-risk students who participated in one or more EPSOs was 56.8% compared to a fall-to-fall retention rate of 47.8% for not at-risk students who did not participate in EPSOs.

Research Question 11 addressed the 2-year graduation rate between students who did participate and students who did not participate in one or more EPSOs. The 2-year graduation rates were significantly higher among students who participated in one or more EPSOs than students who did not participate in one or more EPSOs ($p < .001$). The 2-year graduation rate for students who participated in one or more EPSOs was 21.4% compared to a 2-year graduation rate of 6.2% for students who did not participate in EPSOs. In terms of 2-year graduation rates, these findings were consistent with national percentages of completion rates at public community colleges (Juszkiewicz, 2017).

Research Question 12 addressed the 2-year graduation rate and the number of EPSOs taken by students. I specifically sought to determine if the mean number of EPSO courses taken by students who graduated within 2 years differed significantly from the mean number of EPSO courses taken by students who did not graduate within 2 years. There was a significant difference ($p < .001$) as students who graduated in 2 years had a significantly higher mean number of EPSOs ($M = 2.54$) than students who did not graduate in 2 years ($M = .57$). The 2-year graduation rate for students who participated in one or more EPSOs was 24.1% compared to a 2-year graduation rate of 6.2% for students who did not participate in EPSOs.

Conclusions

The findings of my study demonstrate that participation in EPSOs are associated with increased retention and graduation rates. The major findings from this study include the following statistically significant results regarding retention and graduation rates and EPSO participation at a Tennessee community college:

1. EPSO participants, have higher 2-year and 3-year graduation rates than EPSO non-participants;
2. EPSO participants, regardless of gender, have higher retention and graduation rates than EPSO non-participants;
3. EPSO participants, regardless of Pell eligibility, have higher retention and graduation rates than EPSO non-participants; and
4. EPSO participants, regardless of at-risk status, have higher retention and graduation rates than EPSO non-participants.

Recommendations for Practice

The findings from this study indicate that fall-to-fall retention and graduation rates are significantly higher for students who participate in EPSOs. Student exposure to EPSOs increases student persistence and completion metrics (TDOE, 2017a). In most states, in comparison to 4-year institutions, community colleges are much more prolific in terms of providing EPSOs (Hoffman et al., 2009). Community colleges are positioned to see the direct benefit of improved retention and graduation as they strategically partner with local education agencies (LEAs) to provide access to college coursework for high school students. With retention and completion continuing to emerge as indicators of student success at the community college level, findings from this study indicate that community colleges would benefit from encouraging higher participation in EPSOs by high school students.

Collaboration between LEAs and higher education institutions need to focus on alignment of student learning outcomes and success measures to ensure seamless transitions into higher education. Investment by community colleges in EPSOs will enable students to be

exposed to the academic expectations of higher education and also allow them to move to closer to completion, thereby benefitting both student and institution.

Existing literature is replete with the success that higher achieving and high SES students have experienced by participating in EPSOs. However, in light of the fact that most community colleges are open door institutions, addressing lower achieving (at-risk) and low SES (Pell eligible) students could prove valuable to the improvement of community college student success measures. Both LEAs and community colleges should seek to provide access to as many EPSOs as possible and devote resources to encourage participation, especially for at-risk and lower SES students.

Recommendations for Further Research

There is a need to broaden the present body of knowledge regarding EPSO participation and student success measures. Partnerships between LEAs and community colleges for dual enrollment exist nationwide and are primarily utilized by high achieving students who intend to pursue postsecondary academic pathways. My recommendations for further research are:

1. Evaluate whether there exists a particular number of EPSO courses taken that makes a significant difference in terms of retention and graduation rates. It would be valuable to know the range of courses taken that leads to the highest retention and completion. This could lead to more efficiency of course offerings for LEAs and community college partners.
2. Investigate whether participation in EPSOs on a college campus versus a high school campus makes a significant difference in retention and graduation rates. Many students participate in EPSOs through early college programs that exist on college campuses while others enroll in courses that are offered on their respective high

- school campuses during the school day. It would be of value to know if the atmosphere of college, along with assimilation into actual college classes, significantly impacts retention and graduation rates.
3. Examine EPSO participation rates regarding retention and graduation rates for students of all ethnic backgrounds. Research has shown that ethnic minorities have traditionally had limited access to rigorous and challenging coursework and consequently have not been as successful in higher education environments. Understanding minority participation and success measures by ethnicity could prove beneficial to bridging the gaps of access to EPSOs.
 4. Expand the definition of EPSO to include career and technical education (CTE). My study investigated academic coursework solely. LEAs and community colleges often partner in workforce training. Future studies could examine the benefit, or lack thereof, that CTE has on retention and graduation in academic pathways.
 5. Interview EPSO students to investigate their perceptions, attitudes, and motivations for enrolling in EPSOs. It would be beneficial to understand why they choose to participate and if those reasons contribute to them envisioning themselves as successful college students.
 6. Examine whether access to EPSOs exists equally across all high schools in LEAs regardless of the socioeconomic status of students. Research has shown that low-SES students have traditionally had limited access to rigorous and challenging course offerings. It would benefit the partnerships between LEAs and community colleges to have an understanding of gaps in accessibility to EPSOs.

7. Investigate which EPSO (dual enrollment, AP, or IB) was most effective in terms of increasing retention and graduation rates.

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Tennessee Technological University, Cookeville, Tennessee, 1997
- Professional Experience:
- Associate Professor, Chattanooga State Community College,
Chattanooga, Tennessee,
2013-Current
 - Physical Education Teacher, East Hamilton High School,
Ooltewah, Tennessee,
2011-2013
 - Adjunct Instructor, Chattanooga State Community College,
Chattanooga, Tennessee,
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 - Adjunct Faculty, University of Tennessee at Chattanooga,
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 - Environmental/Physical Science Teacher, Ooltewah High School,
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 - Biology/Physical Science Teacher, Ooltewah High School,
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 - Biology/Environmental/Physical Science Teacher, East Ridge
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