College Success and Early Postsecondary Opportunities

By

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Abstract

The purpose of this quantitative study was to investigate the effects of various EPSOs and college success. Data were gathered from 175 students from a private university in Northeast Tennessee. The 175 students were the freshman cohort from the 2018-2019 school year. 116 students had Early Postsecondary Opportunities (EPSOs) while 59 students did not. The following data for each student were collected: fall 2018 GPA, spring 2019 GPA, fall 2018 retention, 2018-2019 school year retention, number of EPSOs, type of EPSOs, and first grade within five course clusters. The course clusters examined were Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, and STEM. The results suggest that as the number of Early Postsecondary Opportunities increase, first and second-semester GPA tend to increase, and student continuation of college after the first year. Course cluster examination yielded findings that suggest students with EPSO credit score a higher first grade in the Arts & Humanities and STEM clusters and students with Advanced Placement credit score a higher first grade in the Arts & Humanities and Human, Public, & Social Science course cluster compared to those with dual enrollment credit. Recommendations for further study include examination of types of EPSO credits beyond Advanced Placement and dual enrollment, a study to compare college success in students that passed the Advanced Placement exam to receive credit and those who did not, and a study to allow students to provide feedback on Advanced Placement courses versus dual enrollment courses.

Keywords: early postsecondary opportunities, college retention, grade point average, Advanced Placement, dual enrollment, course cluster

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Dedication

I would like to dedicate my dissertation to my family. Wes, Rilynn, Elias and Ashla, we did it!

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This was not possible without my support system and the Milligan family.

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Table of Contents

Tables

CHAPTER 1:

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

Early Postsecondary Opportunities (EPSOs) are opportunities in the form of courses and/or exams that allow college credit to be obtained by students enrolled in high school. (TN Department of Education, n.d.d). With these opportunities comes the benefit of receiving multiple college credits before obtaining a high school diploma. These EPSOs come in many forms, such as Advanced Placement courses, statewide dual credit courses, dual enrollment courses, or International Baccalaureate courses. Advanced Placement and dual enrollment courses are the most common EPSOs students are exposed to (TN Department of Education, n.d.e). Due to this, the focus of this study will be to examine the impact Advanced Placement and dual enrollment courses have on students at the college level.

When allowed to complete EPSOs before college entry, students can begin to develop study skills that will benefit them in succeeding courses (Conley, 2012; Klopfenstein, 2003; TN Department of Education, 2018). However, one study suggests a possible variation in students' skills that take Advanced Placement (AP) courses and do not take the AP exam and those that take AP courses and do take the AP exam (Warne, 2017). Shaw, Marini, and Mattern (2013) found that students who score a 3 or higher on AP exams were found to have higher college retention rate. As with AP, dual enrollment courses also yield a variation in feedback. Students who completed dual enrollment courses felt the course gave them an advantage in terms of college credits, while others felt they were given a false sense of confidence from the course (Jaschik, 2018). According to faculty, much of this belief stemmed from what faculty of such courses believed reduce rigor and expectations in dual enrollment courses (Jaschik, 2018). In

comparison, study completed by Hoffman, Vargas, and Santos (2009) found that dual enrollment courses positively impacted college enrollment, retention and grade point average.

Graduates who take at least one EPSO have a higher percentage of entry of a postsecondary institution 84% of graduates with at least one EPSOs enroll in college. In contrast, enrollment of graduates with no EPSOs is 63% (TN Department of Education, 2018). For dual enrollment, a statewide policy is listed for 46 states in the United States, with 35 of those states not requiring program evaluation (Education Commission of the States, 2020). Advanced Placement had 2,808,990 students participate in the 2018 Advanced Placement program (College Board, 2018). The offering of EPSOs has grown immensely in recent years. According to the TN Department of Education (TDOE), 40% of 2016 high school graduates in the state of Tennessee attempted at least one EPSO (2018).

An area that limits student access to EPSOs is the location of the school district. Although an expansion of dual enrollment and Advanced Placement course offerings in recent years, it has been found that rural school districts may not have the budgetary means to offer such courses (Karp and Hughes, 2008). To offset this barrier, legislation has been passed by states to help reduce cost for districts and students (Education Commission of the States, 2020a; Gagnon & Mattingly, 2016; Pompelia, 2021).

Statement of the Problem

Research has found many benefits as well as limitations to student enrollment in EPSOs. With an increase in EPSOs in the state of Tennessee, students have begun to take advantage of the various opportunities. With this, the problem of how these EPSOs impact student success at the college level arose. Some research has been conducted to include college enrollment, the impact of specific EPSOs, college readiness and ACT, and high school counselors' views of

EPSOs (Fink, Jenkins, and Yanagiura, 2017; Hooker, 2019; TN Department of Education, 2018; Warne, 2017). With much research revolving around data before college enrollment, such as ACT scores, college enrollment status, and high school counselors' view of EPSOs, the focus of this research developed; more information is needed about the college level relationship between EPSOs and college success.

Purpose of the Study

The purpose of this study was to investigate the effects of student participation in EPSOs on postsecondary academic success. The study will look at the number and type EPSOs.

Significance of the Study

EPSOs have yielded much research in terms of student success. With the ability to decrease the cost of a four-year degree, many students have begun to take advantage of gaining college credit while in high school (Loveland, 2017). As the increase of EPSOs is encouraged in secondary education, a factor for examination is how these opportunities benefit students at the college level. For example, in the state of Tennessee EPSOs are indicators for *Ready Graduate*. The relationship of these EPSOs must be examined to determine if such opportunities are increasing student success in college.

Many concerns revolving EPSOs have been expressed throughout the research. If students experience in an EPSO lacked rigor and preparation for college, they enter college lacking in skills needed for success (Klopfenstein, 2003; Laskey & Hetzel, 2011). Examining the impact Advanced Placement and dual enrollment courses have on college success is important. Furthermore, examining the impact the number of EPSOs students have on college success can determine if more exposure to EPSOs yields higher college success.

Research Questions and Hypotheses

RQ1: Is there a significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first semester of college and students who did not?

RQ2: Is there a significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first year of college and students who did not?

RQ3: Is there a significant relationship between student's first-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

RQ4: Is there a significant relationship between student's second-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

RQ5: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received EPSO credit versus those who did not?

SubQ1: Is there a significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received EPSO credit versus those who did not?

SubQ2: Is there a significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received EPSO credit versus those who did not?

SubQ3: Is there a significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received EPSO credit versus those who did not?

SubQ4: Is there a significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received EPSO credit versus those who did not?

SubQ5: Is there a significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received EPSO credit versus those who did not?

RQ6: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ1: Is there a significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ2: Is there a significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ3: Is there a significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ4: Is there a significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ5: Is there a significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received dual enrollment credit versus those who received Advanced Placement credit?

Definition of Terms

1. *Early Postsecondary Opportunities (EPSOs)*- Opportunities in the form of courses and/or exams that allow college credit to be obtained by students enrolled in high school. (TN Department of Education, n.d.d).
2. *Advanced Placement (AP)*- A College Board program that allows high school students to experience postsecondary level courses throughout various subjects. Subject-specific standardized tests allow the students a potential opportunity to gain college credit in the specific course. (TN Department of Education, n.d.a).
3. *Statewide Dual Credit*- Courses taught by a high school teacher trained to teach the course's postsecondary level. (TN Department of Education, n.d.g).
4. *Dual Enrollment*- Courses taught by postsecondary professors at either the high school or college that allow high school students to earn college credit. (TN Department of Education, n.d.b).
5. *International Baccalaureate (IB)*- A course taught with postsecondary rigor to high school students. College credit can be obtained through the international exam given by the International Baccalaureate. (TN Department of Education, n.d.e).

6. *Subsequent class grade*- The grade for the second level of a course. For example, if a student received college credit for Chemistry I, what grade did they receive for Chemistry II.

Subsequent course clusters				
Arts & Humanities	**Human, Public, & Social Sciences**	**Business & Industry**	**Language**	**STEM**
English (ENGL) History (HIST) Humanities (HUMN)	Education (EDUC) Nursing (NURS) Social Work (SOWK) Psychology (PSYC)	Accounting (ACCT) Business Admin. (BADM) Computer Science (CIS)	French (FREN) Spanish (SPAN) Chinese (CHIN) Greek (GREE)	Biology (BIOL) Chemistry (CHEM) Math (MATH)
A grade was requested for the first course a student completed in each cluster.				

7. *Ready Graduate*- A list of indicators for graduates from high schools in Tennessee that measure the number of students who complete milestones such as taking the ACT/SAT, completing 4 EPSOs, completing 2 EPSOs and an industrial certification, completing 2 EPSOs and earn a qualifying ASVAB score. (TN Department of Education, n.d.f).

Limitations and Delimitations

The study included a cohort of a university in Northeast Tennessee undergraduates. Having just one cohort of students restricted data gathered in terms of course credits received. One delimitation is the study was restricted to students at a university in Northeast Tennessee that entered during the Fall 2018 semester.

Organization of Study

Chapter 1 includes the Introduction, Statement of Problems, and the Significance of the Study. A literature review related to Advanced Placement courses, Dual Enrollment courses,

accessibility and barriers to early postsecondary opportunities, college retention, and college readiness is included in Chapter 2. Chapter 3 contains the methodology and research design of the study. The data analysis and findings are presented in Chapter 4. Chapter 5 consists of a summary, discussion, and conclusions from the study and recommendations for further research.

CHAPTER 2:
REVIEW OF LITERATURE

Introduction

As Early Postsecondary Opportunities become more readily available to high school students, the amount of credits a student can obtain before high school graduation has increased dramatically in recent years. According to the TN Department of Education (2018) a goal was set for the majority of 2020 high school graduates to graduate with at least one EPSO. Although EPSOs can consist of various courses such as Advanced Placement, Cambridge International Examinations, Dual Enrollment, International Baccalaureate, Local Dual Credit, Statewide Dual Credit, and Industry Certifications taken most often are Advanced Placement and Dual Enrollment (TN Department of Education, n.d.d).

The review of research will focus on the two main EPSOs, Advanced Placement and dual enrollment courses. The accessibility, benefits, limitations, and outcomes of these particular courses will be reviewed. College readiness and enrollment rate will be defined and discussed how EPSOs impact each one. The rate of retention will be examined by the discussion of college GPA and the variables that cause retention to both increase and decrease. Finally, many barriers present themselves to students wanting to complete EPSOs. Accessibility, teacher requirement and course quality are examined to determine the role each plays in the students' success with EPSOs.

Advanced Placement

The Advanced Placement program started in 1955 to allow high school students the opportunity to earn college credit while in high school through the completion of coursework and an exam at the college level (Geiser & Santelices, 2006; Mattern, Marini, & Shaw, 2013). College Board offers a vast array of advanced placement courses. The advanced placement

courses offered by College Board include subjects such as math, English, science, history, languages, English, arts, and computer science with a total of 38 course options (College Board, 2021d). To receive college credit for an advanced placement course, students must take an exam at the end of the coursework. Exams are scored on a 5-point scale which is equivalent to the following college grades, a 5 is equivalent to an A or A+, a 4 is equivalent to A-, B+, or B, a 3 is equivalent to B-, C+, or C, a score of 2 or 1 does not have an equivalent grade (College Board, 2021b). The score needed to obtain credit for an advanced placement course is dependent on the AP policy set forth by the college or university, with the majority of colleges granted credit for a score of a 3 or above (College Board, 2021a).

Certified high school teachers teach Advanced Placement courses. Many students can take these courses in their own high school setting. However, some high schools offer partner with a program that offers Advanced Placement courses online. These online courses are taught by certified teachers from various high schools employed by the online program. Furthermore, teachers must be certified in the subject to teach an Advanced Placement course within that subject. For example, a certified history teacher can teach AP Comparative Government and Politics, AP European History, AP Human Geography, AP Macroeconomics, AP United States Government and Politics, AP United States History and AP World History: Modern.

According to a study completed by Chajewski et al. (2011), 83.33% of students who take at least one AP exam enroll in a 4-year postsecondary institution. This enrollment is 20% higher than the immediate enrollment to 4-year postsecondary institutions (Hussar et al., 2020). When examining the number of AP exams completed by students, it was found that higher odds of enrollment to a 4-year postsecondary institution were found among students who completed two or three AP exams (Chajewski et al., 2011).

Accessibility

In 2018, a total of 22,612 schools offered advanced placement courses with an average of 9.39 subjects offered per school (College Board, 2020). However, rural schools and schools that serve low-income communities are limited in the number of advanced placement courses offered to students (Gagnon & Mattingly, 2016; Zarate & Pachon, 2006). Gagnon and Mattingly (2016) found rural schools enrolled the lowest percentage of students in at least one advanced placement course at 51.4% followed by 78.3% town schools, 93.8% of suburban schools, and 97.3% urban schools.

According to the Education Commission of the States (2017), rural schools make up about 30% of public schools making up one-fifth of students in public schools. The access gap present among rural schools could be due to various reasons such as shortage in highly qualified teaching staff or lack of capable students (Education Commission of the States 2017; Gagnon and Mattingly, 2015). When examining the access gap, it was found that the school district's size impacts the availability of advanced placement courses (Gagnon and Mattingly, 2015). Larger school districts are more likely to offer at least one advanced placement course regardless of their geographic location.

Benefits

A student perception survey revealed that students perceive advanced placement courses as higher in quality and rigor than other high school courses **(**Cooney et al., 2013). Students stated benefits of the advanced placement course included items such as increased writing and test-taking skills, increased confidence in ability, understanding college expectations, and influenced college major choice (Cooney et al., 2013). Beyond academic benefit, research stated

students receiving credit from AP courses gained a financial benefit due to the ability to complete a degree in four years or less (Warne, 2017; Mattern, Marini, & Shaw, 2013).

Research has determined students completing Advanced Placement coursework have gained many benefits from the exposure to rigor. Hallett and Venegas (2011) found that students that completed the AP exam beyond just experiencing the rigorous coursework, gained more benefits and skills. Advanced Placement students outperform their peers without Advanced Placement experience in college entrance exams, college GPA, college graduation rate, and enrollment for advanced degrees (College Board, 2014; Mattern, Marini, & Shaw, 2013; Warne, 2017). College Board (2014) found that students who score a 3 or higher on an AP exam will perform at or better in subsequent college courses than students who had no AP experience or scored lower than a 3 on the AP exam.

Limitations

According to a study completed by Weinstein (2016), up to 38% of colleges put restrictions on the type and amount of advanced placement courses for which students can receive college credit for. These restrictions limit the number of credits a student can enter college with; therefore, decreasing the number of students who graduate college in less than 4 years (Weinstein, 2016). Mattern, Marini, & Shaw (2013) found that students who scored a 3 or higher on the AP exam are more likely to graduate from a postsecondary institution in 4-years or less. When colleges place restrictions on the number and type of credits students receive for Advanced Placement course, they enroll with fewer college credits. Having fewer college credits leads to higher number of credits needed to graduate and increases the postsecondary degree cost.

In a study completed by Hallett and Venegas (2011), students stated an area that posed a limitation for AP students is the course schedule. Issues that arise from the course schedule could include limitations on exam preparations, less class time to cover material, or conflict with enrolling in multiple AP courses in a semester. Lower time to completely cover material or prepare for the AP exam can hinder student's ability to obtain a passing score on the AP exam.

Teacher quality can be an area that cause much concern to arise in an advanced placement program. The rigor and preparation of a course depends on the teacher's training and dedication (College Board, 2014). Schools, such as rural schools, lack the culture for a robust AP program, from not providing the professional development needed to make teachers more successful (Gagnon & Mattingly, 2016).

Outcomes

Research from Dodd et al. (2002) found that students that received credit via an AP exam earned a grade at or above in a subsequent course. It was found that students that completed an AP exam, regardless of the score, had an increased graduation rate than those who did not take an AP exam (Mattern, Marini, & Shaw, 2013). Moreover, the higher the score on the AP exam the more likely a student would graduate in four years or less; students that scored a 5 were 40% more likely to graduate in four years or less compared to students who scored a 1 (Mattern, Marini, & Shaw, 2013). The increase in graduation rate in four year or less could stem from exposure to college-level material or from entering college with college credits lessening the number of credits needed to graduate (Mattern, Marini, & Shaw, 2013)

Although completion of the AP exam yields positive outcomes for students, Hallett and Venegas (2011) state that taking an AP course without taking the AP exam will not improve student outcomes. This success seen in students could stem from the fact that students who enroll

in AP courses and pass the AP exam are among some of the most academically advanced students in the nation (Hallett and Venegas, 2011, p. 469).

Dual Enrollment

Dual Enrollment courses are postsecondary courses taught at a high school, virtually, or college/university campus (Karp and Hughes, 2008; Lowe, 2010; TN Department of Education, n.d.b.; United States Department of Education, 2019). The United States Department of Education (2019) found that students who attended city schools were found to complete dual enrollment courses at a college/university campus, compared to students who attended rural or suburban schools. Findings yielded a higher percentage of rural students enrolling in online courses than those enrolled in suburban schools (United States Department of Education, 2019). This enrollment is due to the availability of course offerings in rural areas. Some rural schools do not have access to college/university campuses or teachers that can offer dual enrollment courses. Due to the lack of access, the dual enrollment courses are offered via a virtual setting. This format allows students to receive dual enrollment credit when access is limited.

Courses can consist of all high school students or a combination of high school students and college students (Hughes, 2010). These courses are taught by qualified high school teachers or postsecondary professors that have met the requirements but do not have to hold a state teaching license (Hughes, 2010; TN Department of Education, n.d.b). Students enroll in a postsecondary institution and earn both high school and college credit based on completion of course(s) (Hughes, 2010; Pompelia, 2021; TN Department of Education, n.d.b). In most states, a state policy is implemented to outline the requirements of a dual enrollment program (Education Commission of the States, 2020a). 88% of students that enroll in dual enrollment course enroll in a postsecondary institution (Fink et al., 2017).

Accessibility

In prior years, dual enrollment courses were limited to those students that had decided upon the college path (Karp & Hughes, 2008). States have set policies and requirements that can limit student enrollment in the dual enrollment program based upon academic ability (Zinth & Barnett, 2018). Thus, in return limiting the accessibility of dual enrollment courses. Tennessee's policy is stated in Tenn. Code Ann. § 49-15-106 (2021):

> **(a)** A program approved under this chapter shall provide for the award of dual credit for a high school course; provided, that the student successfully completes the high school requirements for the course and the student meets all postsecondary standards for validation of the credit. A program may provide opportunities for dual enrollment.
>
> **(b)** A program approved under this chapter shall be accountable to the state board of education and the governing board of the postsecondary institution and shall conform to the regulations and guidelines of any relevant accrediting bodies.
>
> **(c)** A program of early postsecondary credit approved under this chapter shall operate under the terms of a written agreement signed by the executive director of the board of education, the commissioner of education, the chancellor of the board of regents, the president of the University of Tennessee and the executive director of the Tennessee higher education commission. The agreement shall be reviewed on a periodic basis.
>
> **(d)** A program may be operated in a facility owned or leased by the LEA, the applicant public postsecondary institution or an education partner, if any.

(e) A program approved under this chapter shall comply with the laws and policies of the respective campus on which the program resides relating to the education of students with disabilities and shall comply with all statutes, regulations, policies and guidelines regarding student discipline.

(f) A program approved under this chapter may use state, federal and local funds allocated or appropriated to the LEA and to the applicant public postsecondary institution or its governing board to implement the program. If there is an education partner and if it is a public body, the program may use state, federal and local funds allocated or appropriated to that body. Use of funds shall be subject to any limitations or restrictions placed on those funds by federal or state law or local ordinance.

(g) Except as provided in this chapter and under the terms of the agreement, the state board of education or the postsecondary governing board may waive any law or rule that inhibits or hinders the participating institutions' and schools' abilities to meet the goals of this chapter. Neither the state board of education nor the postsecondary governing boards of postsecondary institutions shall waive regulatory or statutory requirements related to:

(1) Federal and state civil rights;

(2) Federal, state and local health and safety;

(3) Federal and state public records;

(4) Immunizations;

(5) Possession of weapons on school grounds;

(6) Background checks and fingerprinting of personnel;

> **(7)** Federal and state special education services;
>
> **(8)** Student due process;
>
> **(9)** Parental rights;
>
> **(10)** Federal and state student assessment and accountability; and
>
> **(11)** Open meetings.
>
> **(h)** The LEA and the participating postsecondary institution shall determine for each course the length of time of instruction. Depending on the course and the institution that offers it, the length of time of instruction shall be that required for public schools or that required for the attainment of postsecondary learning outcomes. (paras. 1-8)

Tennessee's state policy states, Dual Credit program courses are taught by certified secondary instructors, administered under the supervision of postsecondary faculty or a consortium approved certified secondary instructor (Horn et al., 2018, p. 26). This policy has not set student requirements leaving those requirements for inclusion in a dual enrollment program determined by the postsecondary institution (Education Commission of the States, 2020b). Requirements set forth by various states include grade level, GPA, recommendations, entrance requirements of the postsecondary institution, prerequisite courses, parental approval, or state assessment scores (Education Commission of the States, 2020a).

With the ever-growing access to grants for tuition to dual enrollment programs, many states have begun to close the opportunity gap in the cost of postsecondary education (Education Commission of the States, 2020b; Karp & Hughes, 2008*).* Tennessee has a dual enrollment grant program in place. The TN Department of Education (n.d.c) states:

> To be eligible for the Dual Enrollment Grant program, a student enrolled in an eligible high school must be admitted to and enrolled in an eligible postsecondary institution. Institutional admission requirements will govern the initial grant eligibility of dual enrollment students. (Eligibility section, para. 1)

The requirement for the grant includes 12 items. These items include grade level requirements and meeting admission requirements of the postsecondary institution (TN Department of Education, n.d.c).

Benefits

Students gain many benefits as they participate and complete dual enrollment courses. Students' main benefit in a dual enrollment program is to receive postsecondary credits while still enrolled in high school (Loveland, 2017; Pompelia, 2021). Although the obtainment of postsecondary credits is the main focus of dual enrollment programs, students gain many skills that will benefit them in future endeavors.

In terms of coursework, the experience of rigorous and challenging coursework allows students to develop college readiness (Karp, Hughes, & Cormier, 2012; Loveland, 2017; Pompelia, 2021). Karp and Hughes (2008) found that dual enrollment programs benefit students of rural schools by expanding course offerings that would not be feasible due to budget constraints. Students who enroll in dual enrollment are less likely to have to complete remediation at the postsecondary institution due to rigorous academic exposure (Grubb et al. 2017). Beyond the classroom walls, students that participate in dual enrollment courses have been found to enroll and graduate from postsecondary institutions at a higher rate (Karp, Hughes, & Cormier, 2012; Pompelia, 2021).

The cost of postsecondary institutions is an area of concern for many students and guardians. With the ability to obtain postsecondary credits upon completion of a dual enrollment

course, students, in turn, lessen the cost of a postsecondary degree due to having to complete fewer credits while at the postsecondary level (Loveland, 2017).

Limitations

In order to receive dual enrollment credit, students must enroll in a postsecondary institution. This requirement can prove to be a limitation when the student enrolls in a postsecondary institution as a college student. The postsecondary credit a student earns may present an issue when/if the credit needs to be transferred to another institution (Horn et al., 2018). This requirement becomes a limitation due to the various content structures of dual enrollment courses from different postsecondary institutions (Karp & Hughes, 2008).

The cost of dual enrollment courses can prevent students from enrolling in courses altogether (Pompelia, 2021). Many states have implemented policies that cover some costs associated with dual enrollment courses; other states have determined the cost should be left for districts or students to cover (Education Commission of the States, 2020a; Pompelia, 2021).

Outcomes

A study completed by Fink et al. (2017) found that 88% of students that participate in dual enrollment courses enroll in a postsecondary institution after high school. Dual enrollment courses provide a more rigorous academic course for all qualifying students while positively impacting the high school dropout rate and students' aspirations (Karp & Hughes, 2008). The increase in academic rigor allows students to realize they can complete college-level coursework, leading to increased aspirations.

Beyond the exposure to academic rigor, dual enrollment programs provide a more comprehensive range of opportunities that rural schools would otherwise not be able to offer (Karp & Hughes, 2008). Rural schools may experience limited access to highly qualified

teachers to offer high-level courses to students. Dual enrollment programs allow students to experience rigorous courses through the use of college instructors (Karp and Hughes, 2008).

College Readiness

In recent years a push for college readiness has moved to the focus of secondary education (Henry & Stahl, 2017). The term college readiness can be defined as the student's ability to enroll in a postsecondary institution without remediation and skills necessary to succeed in coursework (Conley, 2010). College entrance exams such as the ACT and SAT have benchmarks that are used to indicate college readiness based on exam scores (Conley, 2010).

The American College Test (ACT) defines college readiness as skills that are essential to students for entry to college (ACT, 2021). According to ACT (2021b) 52% of the 2019 graduating class took the ACT. This test is designed for colleges to use for recruitment, placement, and enrollment due to assessing student's knowledge from high school academics. Scores on the ACT range from 1-36, a score is obtained for four multiple-choice subject area tests and then composite scores are provided by averaging the four subject tests (ACT, 2021b). The ACT college readiness benchmark for English, Reading, Math, and Science is 18, 22, 22, and 23, respectively (ACT, 2018). According to the ACT benchmark, 38% of 2018 high school graduates met three of the four college readiness benchmarks (ACT, 2018). Each benchmark correlates to success in specific courses at the college level; English yields success in Composition I, Math yields success in College Algebra, Reading yields success in Social Sciences, and science yields success in Biology (Allen, & Radunzel, 2017). Findings from a study completed by McKenzie et al. (2020) found that students that completed one or more advanced placement courses received a higher ACT composite score.

The Scholastic Aptitude Test (SAT) also has a set benchmark to indicate college readiness. The SAT exam consists of two multiple-choice sections and is used by colleges for admission purposes (The Princeton Review, 2021). Each section of the SAT is scored on the scale of 200-800, with the two scores totaling the overall SAT score that can be as high as 1600 (The Princeton Review, 2021). According to College Board (2021c), Math and Evidence-Based Reading and Writing benchmarks are 530 and 480, respectively. SAT section scores in Math and Evidence-Based Reading and Writing that meet or exceed benchmark levels have a 75% chance of receiving a grade of C or higher in equivalent college courses (College Board, 2021c). The equivalent courses include college algebra, statistics, pre-calculus, calculus, social sciences, writing courses, history, and literature (College Board, 2021c). College readiness is encouraged through dual enrollment courses through the course's preparation and rigor (Karp, Hughes, & Cormier, 2012).

Rates of Enrollment

The immediate college enrollment rate from 2000 to 2018 increased from 63% to 69%, respectively (Hussar et al., 2020). According to Hussar et al. (2020), the immediate enrollment rate is the percentage of high school graduates that enroll in postsecondary institutions following high school graduation. 44% of 2018 high school graduates enrolled in 4-year postsecondary institutions, while 26% enrolled in 2-year postsecondary institutions (Hussar et al., 2020).

Examining a cohort of 2016 graduates, 84% of students completed an EPSO while in high school enrolled in a postsecondary institution (TN Department of Education, n.d.d). The TN Department of Education (n.d.d) found that 50% of economically disadvantaged students of the 2016 graduating cohort enrolled in a postsecondary institution; however, the percentage increased to 74% for economically disadvantaged students that completed EPSOs.

College Retention

Retention rate is defined by Hussar et al. (2020) as the rate at which students enroll in the fall following their initial year of enrollment as a first-time undergraduate at a postsecondary, each of which at the same postsecondary institution. A retention rate of 81% was achieved for the first time in the fall of 2017 by undergraduate students who were enrolled in a 4-year postsecondary institution (Hussar et al., 2020).

With the exposure to EPSOs, students experience a higher college retention rate (Shaw, Marini, & Mattern, 2013; Hoffman, Vargas, & Santos, 2009). Shaw, Marini, & Mattern (2013) found that the college retention rate was impacted by the AP exam score. While Hoffman, Vargas, & Santos (2009) found that the college retention rate was impacted by enrollment in a dual enrollment course.

Grade Point Average

Grade point average (GPA) is an indicator of how well a student has performed in coursework. High school GPA tends to indicate how well a student will perform at the postsecondary level (Zwick & Sklar, 2005). As students move to the postsecondary level, GPA can then be used for scholarship/grant purposes, program entrance, and graduate program entrance.

GPA and advanced placement courses have been examined in various research. This research has found that a positive correlation is found between AP exam scores and a student's full year college GPA (Geiser & Santelices, 2004; Hargrove et al., 2008; Mattern, Shaw, & Xiong, 2009; Shaw, Marini, & Mattern, 2013). Dual enrollment courses were found to positively impact on college GPA as well (Hoffman, Vargas, & Santos, 2009). The increase in academic rigor that is offered through the enrollment in an AP or dual enrollment course provides students

with more skills needed to succed in college. These skills allow students to be more successful at the college level which is displayed through their college GPA.

Increased Retention

An increase in college retention rate can be observed when examining data about students with EPSOs. According to the Education Commission of the States (2017), advanced placement courses impact college retention. Students who scored a 3 or higher on AP exams such as AP English Literature and others, were found to have a 54% higher retention rate for the fall semester following the first year of enrollment (Shaw, Marini, & Mattern, 2013). Hoffman, Vargas, & Santos (2009) found that students that enrolled in a dual enrollment course had a higher retention rate than students who had no dual enrollment courses.

Decreased Retention

College readiness is a key factor in the retention rates of college students. Being exposed to college level rigor is a benefit of EPSOs. However, if EPSOs such as advanced placement courses do not offer the rigor needed to allow students to gain college readiness skills, they will enter college unprepared (Klopfenstein, 2003). Students who enter college unprepared lack the motivation and skills to pursue a postsecondary degree (Laskey & Hetzel, 2011).

Barriers

Many barriers are present when examining EPSOs. The United States Department of Education (2019) found that first-generation college students are less likely to enroll in dual enrollment courses than those with parents that earned a degree. The accessibility to quality coursework and teaching is an area that can cause much concern when examining EPSOs.

Although grants for dual enrollment programs exist, the cost can become a barrier to many students. Students may not meet the dual enrollment grant eligibility requirements or a

state may not offer any grant options for students. Cost may also limit the number of dual enrollment courses a student enrolls in. Grant money may be limited for a specific type or number of college credits, placing a barrier on student enrollment.

On the other hand, AP exams' cost can cause students to not test for college credit. Each AP exam has a cost; school districts may cover the cost for some or all students. However, if the cost is not covered, then students are left paying for each exam. Therefore, students may enroll in AP courses and not take an AP exam. Research has shown that the coursework does not yield as much success in college as the combination of the coursework and AP exam performance (Chajewski et al., 2011; Shaw, Marini, & Mattern, 2013).

Access

Findings from the 2016 graduating cohort determined economically disadvantaged students are less likely to have a chance to take an EPSO (TN Department of Education, n.d.d). The cost stemming from EPSOs can limit access to many students, parents, and districts (Gagnon & Mattingly, 2016; Pompelia, 2021). Without adequate funds, districts may not have the ability to offer advanced placement courses or to partner with postsecondary institutions for dual enrollment courses (Gagnon & Mattingly, 2016).

Teacher Requirements

Advanced Placement Courses. A teacher for AP courses must first be a certified teacher of the course. For example, an AP Calculus teacher must be certified in math. Beyond this, teachers have no set requirements other than submitting the AP course audit steps (College Board, 2021f). Within the steps of the AP course audit teachers gain course authorization and submit a syllabus that has to be reviewed and approved by College Board (College Board, 2021e) College Board highly encourages teachers to participate in various professional

development opportunities they offer before teaching an AP course (College Board, 2021e; College Board, 2021f). Although teachers have to submit a syllabus and gain authorization through AP course audits, teachers are not required to complete any specific course training.

Dual Enrollment Courses. According to Horn et al. (2018), a state policy for dual enrollment instructor qualifications has been implemented in 42 states. Educators of dual enrollment courses can be qualified to teach at the high school level and also meet the requirements to teach at the postsecondary institution (Hughes, 2010 & TN Department of Education, n.d.b.). However, the qualifications high school educators have to meet are area of concern (Horn et al., 2018). Beyond high school educators, postsecondary educators that meet requirements can teach dual enrollment courses (Hughes, 2010 & TN Department of Education, n.d.b.) According to the TN Department of Education (n.d.b.), these teachers do not have to be a state-certified teacher.

In previous years, expansion of dual enrollment programs stemmed from changes made to state policies (Lowe, 2010). An analysis of state policies by Horn et al. (2018) compiled a list of requirements state policies for dual enrollment educators. Various state policies include a master's degree, qualifications for faculty, and credit hours at the graduate level (Horn et al., 2018).

Course Quality

Advanced Placement. An advantage of an AP course is to provide high school students a rigorous course with an exposure to college-level material in the familiar environment of their high school classrooms (Klopfenstein, 2003). However, teachers' preparation can largely impact the quality of the AP course (Hallett & Venegas, 2011). If the course lacks the rigor necessary for college readiness, students will gain a false sense of college readiness (Klopfenstein, 2003).

The course quality can vary among schools and districts dependent on expectations and support of teaching staff (Hallett & Venegas, 2011).

Dual Enrollment. Due to the rapid expansion of dual enrollment programs, the course and teachers' quality has become a concern (Lowe, 2010). Increasing course enrollment for the sake of providing access for more students can lead to concerns about the rigor and college readiness a course will provide (Lowe, 2010). The requirements set forth by states possibly have an indirect undermining impact on the college enrollment of high school students (Zinth & Barnett, 2018).

CHAPTER 3:

RESEARCH DESIGN AND METHODS

Introduction

The purpose of this study was to investigate the effects of student participation in EPSOs on postsecondary academic success. The study looked at the number and type of EPSOs using archival data provided by the Director of Institutional Research and Effectiveness/SACS Accreditation Liaison and the registrar's office at a university in Northeast Tennessee.

This chapter examines the research design and methods of the research. Research questions and null hypotheses are included, followed by population, instrumentation, data collection and procedures, and data analysis.

Research Questions and Null Hypotheses

RQ1: Is there a significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first semester of college and students who did not?

H_o1: There a no significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first semester of college and students who did not.

RQ2: Is there a significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first year of college and students who did not?

H_o2: There is no significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first year of college and students who did not.

RQ3: Is there a significant relationship between student's first-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

H_o3: There is no significant relationship between student's first-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

RQ4: Is there a significant relationship between student's second-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

H_o4: There is no significant relationship between student's second-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

RQ5: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received EPSO credit versus those who did not?

SubQ1: Is there a significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received EPSO credit versus those who did not?

H_oSubQ1: There is no significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received EPSO credit versus those who did not.

SubQ2: Is there a significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received EPSO credit versus those who did not?

H_oSubQ2: There is no significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received EPSO credit versus those who did not.

SubQ3: Is there a significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received EPSO credit versus those who did not?

H_oSubQ3: There is no significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received EPSO credit versus those who did not.

SubQ4: Is there a significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received EPSO credit versus those who did not?

H_oSubQ4: There is no significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received EPSO credit versus those who did not.

SubQ5: Is there a significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received EPSO credit versus those who did not?

H_oSubQ5: There is no significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received EPSO credit versus those who did not.

RQ6: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ1: Is there a significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ1: There is no significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received dual enrollment credit versus those who received Advanced Placement credit.

SubQ2: Is there a significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ2: There is no significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received dual enrollment credit versus those who received Advanced Placement credit.

SubQ3: Is there a significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ3: There is no significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received dual enrollment credit versus those who received Advanced Placement credit.

SubQ4: Is there a significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ4: There is no significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received dual enrollment credit versus those who received Advanced Placement credit.

SubQ5: Is there a significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ5: There is no significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received dual enrollment credit versus those who received Advanced Placement credit.

Population and Sample

The study used data from the 2018 freshman class at a university in Northeast Tennessee. The data included students from the fall 2018 freshman class at a university in Northeast

Tennessee, using the students without EPSOs as comparison data. Also, the participants were students with EPSOs and students without EPSOs.

The data were gathered from a private university in Northeast Tennessee. The university population was composed of 1,225 undergraduate and graduate students, with 829 undergraduate students. Of the 829 students, 43.2% were male while 56.8% were female. The enrollment included race/ethnicity distribution of 87.8% White, 4.3% Hispanic, 3.6% Black/African American, 2.2% two or more races, 1.4% Asian, 0.3% race unknown, 0.3% Native Hawaiian or other Pacific Islanders, and 0.1% American Indian or Native American.

Of the 829 undergraduates, data were collected from a cohort of freshmen totaling 175 students. Of the 175 students, 84 were male while 91 were female. The race/ethnicity distribution was 85.7% White, 5.1% Hispanic, 3.4% Black/African American, 2.9% race unknown, 1.1% two or more races, 1.1% Asian, and 0.6% Native Hawaiian or other Pacific Islander. Tennessee residents accounted for 121 students in the 175 total. A total of 116 students had EPSOs and 59 students did not have EPSOs.

Instrumentation

Data were provided by the Department of Institutional Research and Effectiveness/SACS Accreditation Liaison and the registrar's office at a university in Northeast Tennessee. Information requested included student fall 2018 GPA, spring 2019 GPA, fall 2018 retention, 2018-2019 school year retention, number of EPSOs, type of EPSOs, AP exams below the credit threshold, and subsequent course grade. For subsequent course grade courses were arranged in the following clusters:

Subsequent course clusters				
Arts & Humanities	**Human, Public, & Social Sciences**	**Business & Industry**	**Language**	**STEM**
English (ENGL) History (HIST) Humanities (HUMN)	Education (EDUC) Nursing (NURS) Social Work (SOWK) Psychology (PSYC)	Accounting (ACCT) Business Admin. (BADM) Computer Science (CIS)	French (FREN) Spanish (SPAN) Chinese (CHIN) Greek (GREE)	Biology (BIOL) Chemistry (CHEM) Math (MATH)
A grade was requested for the first course a student completed in each cluster.				

Data Collection and Procedures

Before research was conducted, a proposal was sent to the Milligan University IRB for approval. Once approved, email communication was used to request permission from the Director of Institutional Research and Effectiveness/SACS Accreditation Liaison and the registrar's office to gather data about the fall 2018 freshman class. All the data were stored electronically. The data were collected and stored in a password-protected excel workbook. An analysis of data were completed with the use of the SPSS version 27 to determine the differences between variables of interest.

Data Analysis

Quantitative analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 27. A t-test was used to calculate significance, if any, among items such as class grade, retention rate, and EPSOs. Linear regression was used to determine a relationship among GPA and EPSOs. SPSS version 27 was used for data analysis for RQ1 – RQ6.

RQ1: An independent t-test was used to assess the difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first semester of college and students who did not?

RQ2: An independent t-test was used to assess the difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first year of college and students who did not?

RQ3: Linear regression was used to assess the relationship between student's first-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

RQ4: Linear regression was used to assess the relationship between student's second-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

RQ5: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received EPSO credit versus those who did not?

SubQ1: An independent t-test was used to assess the difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received EPSO credit versus those who did not?

SubQ2: An independent t-test was used to assess the difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received EPSO credit versus those who did not?

SubQ3: An independent t-test was used to assess the difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received EPSO credit versus those who did not?

SubQ4: An independent t-test was used to assess the difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received EPSO credit versus those who did not?

SubQ5: An independent t-test was used to assess the difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received EPSO credit versus those who did not?

RQ6: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ1: An independent t-test was used to assess the difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ2: An independent t-test was used to assess the difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ3: An independent t-test was used to assess the difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ4: An independent t-test was used to assess the difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ5: An independent t-test was used to assess the difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received dual enrollment credit versus those who received Advanced Placement credit?

Summary

This chapter examined the methodology used in this quantitative research study. Research question and null hypothesis were stated, followed by the population and sample. Instrumentation, data collection and data analysis of archival data was also included in this chapter. Chapter 4 will examine the summary of results.

CHAPTER 4:
DATA ANALYSIS AND FINDINGS

The study aimed to investigate the effects of student participation in EPSOs on postsecondary academic success. This chapter includes an analysis of data for six research questions. Data were gathered from a private university in Northeast Tennessee from the 2018-2019 school year. The data gathered included 116 students with EPSOs and 59 students without.

Demographic Data

The study's population was a private university in Northeast Tennessee with 829 undergraduate students enrolled for the 2018-2019 school year. 87.8% were White, 4.3% were Hispanic, 3.6% were Black/African American, 2.2% were two or more races, 1.4% were Asian, 0.3% were of an unknown race, 0.3% were Native Hawaiian or other Pacific Islander, and 0.1% were American Indian or Native American. 43.2% of students were male and 56.8% were female.

The sample was a cohort of 175 freshmen from the 2018-2019 school year. 85.7% were White, 5.1% were Hispanic, 3.4% were Black/African American, 2.9% were of an unknown race, 1.1% were two or more races, 1.1% were Asian, and 0.6% were Native Hawaiian or other Pacific Islander. 84 students were male while 91 were female. Of the 175 students, 116 students had EPSOs while 59 students did not.

Findings

Research Question 1

RQ1: Is there a significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first semester of college and students who did not?

H_o1: There is no significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first semester of college and students who did not.

An independent-samples t-test was conducted to assess whether the number of Early Postsecondary Opportunities differs significantly between students who continued after their first semester of college and students who did not. Levene's test for equality of variances were assumed equal. No significance was found ($t(173) = 1.727$, $p = .086$). The test variable was the number of Early Postsecondary Opportunities. The grouping variable was students who continued after their first semester of college ($M = 3.721$, $SD = .290$) vs. students who did not ($M = 2.605$, $SD = .752$). The null hypothesis was retained. The results are displayed in Table 1.

Table 1
Independent-Samples t-test on Students Continuing College After First Semester

Category	*M*	*SD*	*df*	*t*	*p*
Students Who Continued	3.721	.290	173	1.727	.086
Students Who Did Not	2.605				

Note. $p < .05$

Research Question 2

RQ2: Is there a significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first year of college and students who did not?

H_o2: There is no significant difference in the number of Early Postsecondary Opportunities credits a student received between students who continued after their first year of college and students who did not.

An independent-samples t-test was conducted to assess whether the number of Early Postsecondary Opportunities differs significantly between students who continued after their first year of college and students who did not. Levene's test for equality of variances were not assumed equal. A significance was found ($t(136) = 2.904$, $p = .001$). The test variable was the number of Early Postsecondary Opportunities and the grouping variable was students who continued after their first year of college ($M = 3.542$, $SD = .345$) vs. students who did not ($M = 1.727$, $SD = .327$). The null hypothesis was rejected. An effect size of .506 was calculated, showing the grouping variable had a relatively medium effect on continuation of college after the first year. The results are displayed in Table 2.

Table 2
Independent-Samples t-test on Students Continuing College After First Year

Category	*M*	*SD*	*df*	*t*	*p*	*ES*
Students Who Continued	3.542	.345	136	2.904	.001	.506
Students Who Did Not	1.727					

Note. $p < .05$

Research Question 3

RQ3: Is there a significant relationship between student's first-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

H_o3: There is no significant relationship between student's first-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

A simple linear regression was calculated to determine if a relationship was present between student's first-semester college GPA and the number of Early Postsecondary Opportunities credits a student received. A significant regression equation was found [F (1, 73) = 27.857, p =.001] with R^2 of .139. This suggests that 13.9% of the variance in student first-semester college GPA can be explained by EPSO and 86% of the variance could be explained by other variables. The results are displayed in Table 3.

Table 3
Regression Coefficients for Student's First-Semester College GPA and The Number of Early Postsecondary Opportunities

Category	*M*	R^2	Beta	Significance
First-Semester College GPA	2.961	.139	.372	.001
Number of Early Postsecondary Opportunities	3.086			

Research Question 4

RQ4: Is there a significant relationship between student's second-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

H_o4: There is no significant relationship between student's second-semester college GPA and the number of Early Postsecondary Opportunities credits a student received?

A simple linear regression was calculated to determine if a relationship was present between student's second-semester college GPA and the number of Early Postsecondary Opportunities credits a student received. A significant regression equation was found [F (1, 161) = 23.047, p =.001] with R^2 of .125. This suggests that 12.5% of the variance in student second-semester college GPA can be explained by EPSOs and 87.5% of the variance could be explained by other variables. The results are displayed in Table 4.

Table 4
Regression Coefficients for Student's Second-Semester College GPA and The Number of Early Postsecondary Opportunities

Category	*M*	R^2	Beta	Significance
Second-Semester College GPA	3.045	.125	.354	.001
Number of Early Postsecondary Opportunities	3.215			

Research Question 5

RQ5: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received EPSO credit versus those who did not?

SubQ1: Is there a significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received EPSO credit versus those who did not?

H_oSubQ1: There is no significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received EPSO credit versus those who did not.

An independent-samples t-test was conducted to assess whether the first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) differs significantly between students who received EPSO credit versus those who did not. Levene's test for equality of variances were not assumed equal. A significance was found ($t(122) = 4.369$, $p = .001$). The test variable was the first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) and the grouping variable was students who received EPSO credit ($M = 3.222$, $SD = .874$) vs. students who did not ($M = 2.525$, $SD = 1.113$). The null hypothesis was rejected. An effect size of 0.713 was calculated, showing the grouping variable had a relatively large effect on first course grade. The results are displayed in Table 5.

Table 5
Independent-Samples t-test on First Course Grade Within the Arts & Humanities Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*	*ES*
Students With EPSO credit	3.222	.874	122	4.369	.001	.713
Students Without EPSO credit	2.525					

Note. $p < .05$

SubQ2: Is there a significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received EPSO credit versus those who did not?

H_oSubQ2: There is no significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received EPSO credit versus those who did not.

An independent-samples t-test was conducted to assess whether the first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) differs significantly between students who received EPSO credit versus those who did not. Levene's test for equality of variances were assumed equal. No significance was found ($t(63) = .444$, $p = .659$). The test variable was the first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) and the grouping variable was students who received EPSO credit ($M = 3.350$, $SD = .734$) vs. students who did not ($M = 3.240$, $SD = 1.025$). The null hypothesis was retained. The results are displayed in Table 6.

Table 6
Independent-Samples t-test on First Course Grade Within the Human, Public, & Social Science Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*
Students With EPSO credit	3.350	.734	63	.444	.659
Students Without EPSO credit	3.240				

Note. $p < .05$

SubQ3: Is there a significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received EPSO credit versus those who did not?

H_oSubQ3: There is no significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received EPSO credit versus those who did not.

An independent-samples t-test was conducted to assess whether the first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) differs significantly between students who received EPSO credit versus those who did not. Levene's test for equality of variances were assumed equal. No significance was found ($t(65) = 1.022$, $p = .311$). The test variable was the first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) and the grouping variable was students who received EPSO credit ($M = 3.740$, $SD = .434$) vs. students who did not ($M = 3.340$, $SD = .872$). The null hypothesis was retained. The results are displayed in Table 7.

Table 7
Independent-Samples t-test on First Course Grade Within the Business & Industry Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*
Students With EPSO credit	3.740	.434	65	1.022	.311
Students Without EPSO credit	3.340				

Note. $p < .05$

SubQ4: Is there a significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received EPSO credit versus those who did not?

H_oSubQ4: There is no significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received EPSO credit versus those who did not.

An independent-samples t-test was conducted to assess whether the first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) differs significantly between students who received EPSO credit versus those who did not. Levene's test for equality of variances were assumed equal. No significance was found ($t(37) = .550$, $p = .586$). The test variable was the first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) and the grouping variable was students who received EPSO credit ($M = 3.600$, $SD = .452$) vs. students who did not ($M = 3.390$, $SD = .917$). The null hypothesis was retained. The results are displayed in Table 8.

Table 8
Independent-Samples t-test on First Course Grade Within the Language Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*
Students With EPSO credit	3.600	.452	37	.550	.586
Students Without EPSO credit	3.390				

Note. $p < .05$

SubQ5: Is there a significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received EPSO credit versus those who did not?

H_oSubQ5: There is no significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received EPSO credit versus those who did not.

An independent-samples t-test was conducted to assess whether the first course grade within the STEM course cluster (BIOL, CHEM, MATH) differs significantly between students who received EPSO credit versus those who did not. Levene's test for equality of variances were not assumed equal. A significance was found ($t(133) = 4.438$, $p = .001$). The test variable was the first course grade within the STEM course cluster (BIOL, CHEM, MATH) and the grouping variable was students who received EPSO credit ($M = 3.001$, $SD = .952$) vs. students who did not ($M = 2.162$, $SD = 1.310$). The null hypothesis was rejected. An effect size of .734 was calculated, showing the grouping variable had a relatively large effect on first course grade. The results are displayed in Table 9.

Table 9
Independent-Samples t-test on First Course Grade Within the STEM Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*	*ES*
Students With EPSO credit	3.001	.952	133	4.438	.001	.734
Students Without EPSO credit	2.162					

Note. $p < .05$

Research Question 6

RQ6: Is there a significant difference in first course grade within a course cluster (Arts & Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that received dual enrollment credit versus those who received Advanced Placement credit?

SubQ1: Is there a significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ1: There is no significant difference in first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) between students that received dual enrollment credit versus those who received Advanced Placement credit.

An independent-samples t-test was conducted to assess whether the first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) differs significantly between students who received dual enrollment credit versus those who received Advanced Placement credit. Levene's test for equality of variances were assumed equal. A significance was found ($t(100) = 2.387$, $p = .019$). The test variable was the first course grade within the Arts & Humanities course cluster (ENGL, HIST, HUMN) and the grouping variable was students who received dual enrollment credit ($M = 3.107$, $SD = .897$) vs. students who received Advanced Placement credit ($M = 3.576$, $SD = .703$). The null hypothesis was rejected. An effect size of .549 was calculated, showing the grouping variable had a relatively large effect on first course grade. The results are displayed in Table 10.

Table 10
Independent-Samples t-test on Arts & Humanities Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*	*ES*
Students With dual enrollment credit	3.107	.897	100	2.387	.019	.549
Students with Advanced Placement credit	3.576					

Note. $p < .05$

SubQ2: Is there a significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ2: There is no significant difference in first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) between students that received dual enrollment credit versus those who received Advanced Placement credit.

An independent-samples t-test was conducted to assess whether the first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) differs significantly between students who received dual enrollment credit versus those who received Advanced Placement credit. Levene's test for equality of variances were not assumed equal. A significance was found ($t(20) = 4.605$, $p = .001$). The test variable was the first course grade within the Human, Public, & Social Science course cluster (EDUC, NURS, SOWK, PSYC) and the grouping variable was students who received dual enrollment credit ($M = 3.260$, $SD = .739$) vs. students who received Advanced Placement credit ($M = 4.000$, $SD = .000$). The null hypothesis was rejected. An effect size of 1.054 was calculated, showing the grouping variable had a relatively large effect on first course grade. The results are displayed in Table 11.

Table 11
Independent-Samples t-test on Human, Public, & Social Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*	*ES*
Students With dual enrollment credit	3.260	.739	20	4.605	.001	1.054
Students with Advanced Placement credit	4.000					

Note. $p < .05$

SubQ3: Is there a significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ3: There is no significant difference in first course grade within the Business & Industry course cluster (ACCT, BADM, CIS) between students that received dual enrollment credit versus those who received Advanced Placement credit.

Not enough students with Advanced Placement credit in the Business & Industry course cluster (ACCT, BADM, CIS) to test.

SubQ4: Is there a significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ4: There is no significant difference in first course grade within the Language course cluster (FREN, SPAN, CHIN, GREE) between students that received dual enrollment credit versus those who received Advanced Placement credit.

Not enough students with Advanced Placement credit in the Language course cluster (FREN, SPAN, CHIN, GREE) to test.

SubQ5: Is there a significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received dual enrollment credit versus those who received Advanced Placement credit?

H_oSubQ5: There is no significant difference in first course grade within the STEM course cluster (BIOL, CHEM, MATH) between students that received dual enrollment credit versus those who received Advanced Placement credit.

An independent-samples t-test was conducted to assess whether the first course grade within the STEM course cluster (BIOL, CHEM, MATH) differs significantly between students who received dual enrollment credit versus those who received Advanced Placement credit. Levene's test for equality of variances were assumed equal. No significance was found ($t(68) = 1.360$, $p = .178$). The test variable was the first course grade within the STEM course cluster (BIOL, CHEM, MATH) and the grouping variable was students who received dual enrollment credit ($M = 2.891$, $SD = .843$) vs. students who received Advanced Placement credit ($M = 3.212$, $SD = .997$). The null hypothesis was retained. The results are displayed in Table 12.

Table 12
Independent-Samples t-test on STEM Course Cluster

Category	*M*	*SD*	*df*	*t*	*p*
Students With dual enrollment credit	2.891	.843	68	1.360	.178
Students with Advanced Placement credit	3.212				

Note. $p < .05$

Summary

This chapter contains an analysis of the data pertaining to the research study. Data from 175 students from a private university in Northeast Tennessee were analyzed. The data were collected from 116 students with EPSOs and 59 students without EPSOs from the 2018 -2019 school year. Findings were addressed for six research questions and null hypotheses. Chapter 5 will provide a summary and discussion of the findings of this research study. Recommendations for further research will conclude Chapter 5.

CHAPTER 5:
SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The offering of Early Postsecondary Opportunities has increased immensely over the past ten years. 40% of the 2016 graduation class from the state of Tennessee attempted at least one EPSO (TN Department of Education, 2018). Tennessee set a goal to increase the percentage to include the majority of graduates in the 2020 class (TN Department of Education, 2018). The initiative to increase participation in EPSOs was due to research on benefits found in Chapter 2. This study was performed to investigate the effects of student participation in EPSOs on postsecondary academic success.

This chapter includes a summary and discussion of the findings of the study. These findings will be used to support or refute the research reviewed in Chapter 2, followed by the limitations and conclusion of the study. Recommendations for practice and recommendations for future research will conclude Chapter 5.

Summary of Findings

The results from this study yielded significant findings in the area regarding the number of Early Postsecondary Opportunities and student continuation of college after the first year. The first year of college was then examined, a relationship was found among the number of Early Postsecondary Opportunities and student GPA for the first and second semester of college. Taking a closer look at course offerings within a semester, the study found a significant difference in course cluster grades in the Arts & Humanities and STEM clusters between students that received Early Postsecondary Opportunity credits and those who did not. An examination of types of Early Postsecondary Opportunities yielded results that indicated a significant difference in the first grade within the Arts & Humanities and Human, Public, &

Social Science course cluster between students with dual enrollment credit and students with Advanced Placement credit.

Discussion of Findings

Early Postsecondary Opportunities and College Retention

Studies from Shaw, Marini, and Mattern (2013) and Hoffman, Vargas, and Santos (2009) found that exposure to Early Postsecondary Opportunities increased student retention in college. The above studies supported this study's findings that indicated a significant difference between the number of Early Postsecondary Opportunities in students who continued after their first year of college and those who did not. Continuation of college after first year increased with the more Early Postsecondary Opportunity credits a student received.

Although Shaw, Marini, and Mattern (2013) and Hoffman, Vargas, and Santos (2009) findings state student retention increases with exposure to Early Postsecondary Opportunities. This study found no significant difference regarding the number of Early Postsecondary Opportunities and college continuation after the first semester. However, this finding could stem from the large number of students that continue after the first semester at the private university examined in the study. The retention rate for the private university in Northeast Tennessee for Fall 2018-Spring 2019 was 95.12%.

Early Postsecondary Opportunities and GPA

Research indicates that exposure to academic rigor before to postsecondary enrollment has a positive impact on GPA. When examining dual enrollment and Advanced Placement courses, studies found a positive correlation in participation and college GPA (Geiser & Santelices, 2004; Hargrove et al., 2008; Hoffman, Vargas, & Santos, 2009; Mattern, Shaw, & Xiong, 2009; Shaw, Marini, & Mattern, 2013). The findings of this study support the research. A

positive relationship was found between the number of Early Postsecondary Opportunities and student's first and second semester GPA. As the number of Early Postsecondary Opportunities increase college GPA tends to increase. Increasing the number of Early Postsecondary Opportunities allows students to gain a higher level of college readiness (Conley, 2012, Klopfenstein, 2003; TN Department of Education, 2018). Therefore, an increase in Early Postsecondary Opportunities can increase a student's college readiness.

Early Postsecondary Opportunities and Course Clusters

The study found a significant difference in course cluster grades in the Arts & Humanities and STEM clusters between students that received Early Postsecondary Opportunity credits and those who did not. For the Arts & Humanities course cluster, students with EPSO credit had a mean grade of B while students without EPSO credits had a mean grade of C+. For the STEM course cluster, students with EPSO credit had a mean grade of B. In contrast, students without EPSO credit had a mean grade of C. These findings support research from Chapter 2 which found that students that participate in EPSO courses gain skills that benefit them in succeeding courses (Conley, 2012, Klopfenstein, 2003; TN Department of Education, 2018).

No significant difference was found for the Human, Public, & Social Science, Business & Industry, and the Language course clusters. All course clusters did yield higher first grades for students with Advanced Placement credits. However, the small number of students with Advanced Placement credit could explain the data in the course clusters where no significance was found.

The study found a significant difference in first grade within the Arts & Humanities and Human, Public, & Social Science course cluster between students with dual enrollment credit and students with Advanced Placement credit. For the Arts & Humanities course cluster,

students that completed Advanced Placement courses had a higher grade than those that completed dual enrollment courses. For the Human, Public, & Social Science course cluster, students that completed Advanced Placement courses had a grade of one letter higher than those that completed dual enrollment courses. These findings result from a difference in curriculum between Advanced Placement courses and dual enrollment courses. All Advanced Placement courses follow the same curriculum from College Board, while the postsecondary institution sets dual enrollment course curriculum. These findings support College Board (2014) research that states students who obtained college credit via AP exam scores will perform at or better in the subsequent college course than students who had no AP experience.

Limitation of the Study

The following research question would have added to the study: Is there a significant difference in first course grade within a course cluster (Art/Humanities, Human, Public, & Social Sciences, Business & Industry, Language, STEM) between students that took an Advanced Placement exam and did not receive credit and those that took an Advanced Placement exam and received college credit? However, this research question was unable to be examined due to the sample size versus the subject pool.

This study included a sample of one cohort of students. Having one cohort of students limited the data gathered on course credits and Early Postsecondary Opportunity credits. Thus, causing the sample size for various research questions to be limited.

The private university in Northeast Tennessee had a high retention rate for the fall 2018-spring 2019 school year. Thus, causing there to be a low sample size to subject pool ratio for research question 1.

Conclusions

With the findings, this study suggests Early Postsecondary Opportunities are beneficial to students. The study's findings suggest the continuation of college beyond the first year tends to increase with an increase in the number of Early Postsecondary Opportunities. Also, increasing the number of Early Postsecondary Opportunities tends to increase full-year college GPA.As number of Early Postsecondary Opportunities increases, the benefits from the experiences tend to increase as well. Increasing the number of Early Postsecondary Opportunities exposes students to academic rigor that expands their skills to achieve a higher level of college readiness (Conley, 2012, Klopfenstein, 2003; TN Department of Education, 2018).

Students that participated in Early Postsecondary Opportunities were found to have a higher first grade in the Arts & Humanities and Human, Public, & Social Science course cluster. It was also found that students with Advanced Placement EPSOs outperformed students with dual enrollment courses in the Arts & Humanities and STEM course clusters. Students that participate in EPSO tend to be more prepared for succeeding courses at the college level (Conley, 2012, Klopfenstein, 2003; TN Department of Education, 2018).

Recommendations

Recommendations for Practice

Based on the study, the following recommendations for practice are made:

- High schools should expand Early Postsecondary Opportunity courses. Allowing students the ability to take more than one EPSO.
- High schools should arrange the master schedule to allow for students to participate in multiple EPSOs within a semester.

- High schools should expand the number of Arts & Humanities and STEM Advanced Placement courses offered.
- Counselors should provide support for all students to expand the population of participants in EPSOs.
- Postsecondary institutions should provide support to students that do not have any EPSO credits. This support could help increase college retention for these students.

Recommendations for Future Research

- Research that analyzes types of Early Postsecondary Opportunities beyond Advanced Placement and dual enrollment. These types of EPSOs could include statewide dual credit, International Baccalaureate (IB), and industry certification.
- A qualitative research study could be completed to allow students to provide feedback on Advanced Placement courses versus dual enrollment courses.
- Research that test for significance between students that took an Advanced Placement exam and did not receive credit and those that took an Advanced Placement exam and received college credit.

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Appendix A

MILLIGAN
UNIVERSITY

Date: October 15, 2020

From: The Institutional Review Board (IRB) at Milligan University

Re: *The relationship between college success and early post secondary opportunities*

Submission type: Revised Submission

Dear Ashley Peer,

On behalf of the Milligan University Institutional Review Board (IRB), we are writing to inform you that your study, *The relationship between college success and early post-secondary opportunities*, has been approved as expedited. This approval also indicates that you have fulfilled the IRB requirements for Milligan University.

All research must be conducted in accordance with this approved submission, meaning that you will follow the research plan you have outlined here, use approved materials, and follow university policies.

Take special note of the following important aspects of your approval:

- Any changes made to your study require approval from the IRB Committee before they can be implemented as part of your study. Contact the IRB Committee at **IRB@milligan.edu** with your questions and/or proposed modifications.
- If there are any unanticipated problems or complaints from participants during your data collection, you must notify the Milligan University IRB Office within 24 hours of the data collection problem or complaint.
- Your Milligan IRB Approval Code is: MU2010151155

The Milligan University IRB Committee is pleased to congratulate you on the approval of your research proposal. Best wishes as you conduct your research! If you have any questions about your IRB Approval, please contact the IRB Office and copy your faculty adviser if appropriate on the communication.

Sincerely,

The IRB Committee