DUAL ENROLLMENT: FINDING A BALANCE

by

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ABSTRACT

Dual credit student numbers have been growing at an exceeding rate. From 2000 to 2017, students enrolled in dual credit has jumped 753% (Texas Higher Education Board, 2018). As more students continue to enroll in dual credit courses and states develop initiatives that encourage dual credit enrollment, the challenge of identifying how many dual credit hours should be taken to ensure student success becomes ever more present. This study determined influential factors of student academic success as well as the relationship between dual credit and first-year GPA. Student records and information utilized in this study were collected through institutional data at West Texas A&M University.

Factors of dual credit participation include minimized long-term costs of higher education, faster completion rate, and exposure to college courses. The enrollment of dual credit is beneficial academically to students as long as there is not an excessive amount of hours taken. Varying factors have an impact on retention rates with dual credit as a factor of first-year retention for students at West Texas A&M University. Implications from this study suggest students who enroll in dual credit between 20 and 35 credit hours may have a higher first-year GPA their first year of college. Relevance between retention and dual credit hours is present when students take 19 or more dual credit hours.

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CHAPTER I

INTRODUCTION

Background and Setting

In 2018, roughly 1,200 first-year students enrolled at West Texas A&M University. First-year students encompass students that have had no prior college credit outside of dual credit hours earned in high school. Of 1,200 first-year students, 852 earned college credit while in high school (West Texas A&M University, 2018). Overall, in Texas during the 2017 school year, 151,669 students participated in dual credit (Miller et al., 2018). The increasing number of students enrolling in dual credit programs raises questions over how many credit hours are beneficial to students' academic success. Currently, Texas does not have a set maximum on the number of total dual credit hours a high school students can earn, though there is a minimum requirement of 12 hours of college credit that school districts must provide to students (TEA Dual Credit FAQ, 2020). Previously, there were limitations in place to keep students from taking an excessive amount of dual credit hours and ensuring they are not participating if they are not college-ready. However TEC 28.009 prevents the TEA from instilling a limit on the number of dual credit hours a student can take per semester, but districts and local institutions can enact a limitation. (TEA Dual Credit FAQ, 2020).

Students taking college credit while in high school can receive instruction through various formats. Per Texas Education Agency (2020), also known as TEA, dual credit

programs can be taught online, on college campuses, on the high school campus, or on a remote campus. This gives students flexibility and availability when considering courses that fit best with their schedules. Students may also be offered dual credit through 2 or four-year universities. West Texas A&M University currently offers the Pre-University Program (PUP) for students in participating school districts (West Texas A&M University, n.d.b). This program allows students to complete college credit at a reduced rate of $150 a course while allowing students to enroll in two courses each semester. Students can participate in these courses online or in-person on campus; most of the courses are offered online (West Texas A&M University, n.d.b). Offering students college courses in high school allows West Texas A&M University to promote higher education to students while providing more accessible enrollment if they complete at least six credit hours and have a GPA of 2.0 before their high school graduation.

Saving time and money on college tuition pushes students to enroll in dual credit programs (TEA Dual Credit FAQ, 2020). By receiving college credit through dual credit, students can complete their undergraduate degree at a faster rate. Allowing students to graduate sooner does imply that students save money on tuition in the long run (TEA Dual Credit FAQ, 2020). However, the number of credit hours students take can impact the time it takes to complete a four-year degree and may give students a false sense of confidence in college readiness (Nelson, 2014). Students may use dual credit opportunities to complete courses of little interest early, allowing them to take more courses of interest post-high school (Nelson, 2014). Completing these courses can help students improve their high school ranking while giving students more opportunities for scholarships and an advantage for college applications.

In October of 2000, the Texas Higher Education Coordinating Board (2016a) created *Closing the Gaps by 2015* to encourage student enrollment and success in higher education and essentially push Texas to be a leader in higher education. Due to this push, from fall 2000 to fall 2015, the state of Texas saw total increase of approximately 605,000 students (Texas Higher Education Board, 2016a). While this number is substantial, it fell just short of their goal of 630,000 students (Texas Higher Education Board, 2016a). Developing a program that encourages students to participate in college courses can ultimately encourage the students to enroll in higher education while helping them graduate from college faster. Obtaining a degree has a positive correlation to individuals' quality of life while also benefiting society through filling important roles (Akos & Kretchmar, 2017). Having more students completing their college degree is crucial in improving individuals' lives and society. Completing dual credit gives students the ability to complete their college degrees faster, which allows them to materialize the benefits of a college degree sooner.

In the spring of 2018, Shapiro et al. (2018) reported a 1.5% increase at a six-year completion rate nationally from the fall 2011 cohort. While this research provides a substantial look into how the number of students in college is completing their degrees, the total percent had only reached 58.3% for the fall 2012 cohort (Shapiro et al., 2018). Student completion rates have increased, and it is essential to consider if dual credit allows students to be better prepared when entering into university and completing their degree.

The college or university is ultimately responsible for the content and awarding of grades for college credit, and the high school is responsible for determining how that

course applies to high school credit. Both have to work cohesively in determining the final grades for the student to be accurately awarded credit in that course(s) (Texas Education Agency, 2020). However, dual credit is the most common way that students earn college credit while in high school; students can earn college credit through advanced placement (AP) courses and the college level examination program (CLEP). AP courses can be considered dual credit and AP courses through approval of the College Board and must be approved through the AP Course Audit (Texas Education Agency, 2020).

College readiness exams are not the only influences student retainment and prioritization of academic success. Interaction with campus events and organizations can play a pivotal role in whether or not that student is retained (Astin, 1984; Krumrei-Mancuso et al., 2013; Kuh et al., 2010; Lotowski et al., 2004). Student involvement has been heavily researched to correlate with student success and retention (Han et al., 2017; Kuh et al., 2016; Webber et al., 2013). Troutman et al. (2018) interviewed students and found that students reflected on missing out on opportunities due to their shortened time on campus they would otherwise have if they had not participated in dual credit.

A student's account of struggling to balance their workload and participation in organizations was also due to the workload that upper-level courses presented (Troutman et al., 2018). This factor must be taken into account by both advisers and students as they enroll in dual credit. Building relationships through events and organizations can help students persevere through college and the student's intrinsic motivation and grit (Johnson, 2019). Universities must be aware of impacts on first-year retention, including how the number of dual credit hours taken can influence academic success and retention

to serve their student population better. By better understanding optimal credit hours, colleges, universities, and advisors are better able to recommend students to ensure student success.

<center>Statement of the Problem</center>

With the increasing enrollment of dual credit students, there is little guidance provided regarding the best practice when taking dual credit courses. It is believed if a student meets admissions criteria, they have the capability to be successful. However, the National Center for Education Statistics (2018) showed the 2017 to 2018 school year retention rate for West Texas A&M University was 65% of students after their first year. In comparison, the reported national retention rate for 2018 was 71% (National Center for Education Statistics, 2018). With this disparity, a need arises for increased retention efforts, which benefit both the institution and its students. This study sought to use research concerning college credit, academic achievement, and the influence of dual credit on first-year students' academic success and retention to improve recommendations given to students pursuing college credit while in high school and provide information regarding student characteristics to serve dual credit students better.

West Texas A&M University strives to advise students for the accurate number of credit hours individual students should be taking as it falls on the university to ensure that the students are retained after their first semester and year. These findings provide authentic and influential results which can benefit high school students and advisors or counselors depending on their role in the students' academic careers. However, further research is needed to determine what high school students can do to be more prepared for dual credit and, in turn, college or university courses.

Purpose and Questions

The purpose of this study was to determine the effective range of dual credit hours in determining the academic success of first-year students. Within 2018 to 2019 first-year cohorts, there is also the interest in comparing the impact of dual credit on a participant's academic success within their college. Specific research questions for this survey include:

1. Is there a difference in first-year academic success when comparing students with dual credit to those without dual credit?

2. Do dual credit hours correlate with first-year GPA?

3. Is there a significant change in academic success depending on the number of dual credit hours a student took?

4. What are the characteristics of students retained at WTAMU compared to those who departed from the university?

Definition of Terms

In order to help the reader better understand the context and applications of this study, the following terms must first be defined and understood.

Dual Enrollment: May also be referred to as dual credit. As defined by The Texas Education Agency (2019):

> Dual credit is a system in which an eligible high school student successfully completes a college course(s) that is paired to a high school course required for graduation and receives credit for the course on both the college and the high school transcripts (p. 4)

First-year student: A student that was not previously enrolled at West Texas A&M University with no prior college experience other than of dual credit hours earned in high school.

Retention: The institution's ability to keep or maintain student enrollment from one term to the next.

Involvement: Time a student spends in the classroom or institutional related activities to immerse themselves in the culture of the school.

Post High School Credit: College credit obtained by the student by taking college courses after graduating from high school.

Student Success: Completion of a program and high academic performance, in regards to grade point average.

GPA: Grade Point Average, a calculation used to determine overall academic performance.

First-Year GPA: The grade point average students earned from their first year in college. Dual credit hours do not effect first-year GPA.

Departure: Used to describe a student's decision to leave an institution.

Transition: Phase where students transfer from one academic institution to another. This includes high school to college or university.

Open enrollment: An institutional policy that allows for on-demand enrollment of students irrespective of individual qualifications.

Freshmen: Used to describe a student with 0 to 29 college-level hours.

Sophomore: Used to describe a student with 30 to 59 college-level hours.

Junior: Used to describe a student with 60 to 80 college-level hours.

Senior: Used to describe a student with 90 plus college-level hours.

Limitations

The limitations of this study were impacted by the records retained by West Texas A&M University. As the university does not retain detailed student records prior to Spring 2019. Due to this limitation, only one full academic year that was not impacted by the SARS-CoV-2 virus (COVID-19) pandemic could be used in this study. The study was also limited to first year students in the 2018-2019 cohort at West Texas A&M University.

While the study did include an array of students from across West Texas A&M University, representation of each college was not equal due to the program selection of enrolled students. The Paul Engler College of Agriculture and Natural Sciences has a higher student representation in the study as it had the highest number of students enrolled for the 2018-2019 school year. General Studies had the least representation as it had the lowest number of students enrolled for the 2018-2019 school year.

Measurement of student success changes depending on how success is viewed. Traditionally, colleges and universities utilize grade point average as the marker for student success. However, success could be viewed differently depending on the individual and the goals they wish to accomplish. A student may place being more active in groups and activities over having a high grade point average. Alternatively, if the student worked full time or cared for their family full time, success may be measured as balancing their personal life and completing courses with little regard for a high grade point average. These factors limited the study as the students' personal view of success were not taken into account, only grade point average was utilized to determine student success.

Through the utilization of quantitative data reported through student records, there is a limitation of knowledge regarding other factors that may have impacted students' academic success in their first year. Information regarding student involvement was not requested and would have required thorough surveying to determine involvement and interaction, which this study did not encompass as a part of the research. There was also limited knowledge of the GPA students received in dual credit courses. When dual credit students start their first semester at West Texas A&M University, their GPA starts over and thus their first-year GPA would not be impacted by the grades earned from their dual credit courses. This made it difficult to compare the performance of the students while they were in dual credit courses to the performance, they had at West Texas A&M University in relation to the number of dual credit hours taken.

Dual credit enrollment can have varying factors when it comes to why students choose to participate in it. In a research setting, it would be ideal for there to be a random selection of students to participate in dual credit courses and evaluate their continued academics after their dual credit experience. Enrollment of dual credit can be impacted by student's motivation and self-fulfillment, pressure from guardians, peers, or school faculty and staff, or they may enroll in dual credit to get ahead when they enroll in an institution. These factors may carry into students' motivations when they start their first semester at a college or institution. Researchers were not sure of the motivation behind this population of students enrolled in dual credit other than what had been generalized in previous studies of dual credit students.

<u>Significance of Study</u>

The implications of this information can change how West Texas A&M University and individual departments in the university assist students with dual credit based on the credit hours brought in. Understanding the impact that dual credit has on academic success is crucial for colleges implementing guidelines surrounding the credit hours students can earn through dual credit. Suppose a general amount of dual credit hours can be found significant to academic success. In that case, the institution can direct students to courses in their first year that will help them acclimate to the demands of a university while still being successful. This can also benefit college counselors of high school students by giving them a chance to make recommendations of dual credit hours that will benefit the student the most.

While this study is intended to provide a picture of the cognitive predispositions of 2018 to 2019 first-year students at West Texas A&M University, it can also be helpful in developing recruitment efforts. Alternatively, this study can help advisors create a plan of action for dual credit students depending on the needs to be met, which can help ease student concerns when enrolling in dual credit. This information has the potential to shape West Texas A&M University's recruitment and retention efforts while providing important information to other colleges and universities seeking to improve first-year student success. Information collected and analyzed in this study can provide a wider array of knowledge to institutions as they develop and plan resources and recruitment efforts for dual credit students to ensure overall student success.

CHAPTER II

REVIEW OF LITERATURE

Overview

The previous chapter introduced potential factors relating to dual credit concerning this study and the impact on first-year students at West Texas A&M University in the 2018-2019 cohort. The following chapter will highlight relevant research regarding dual credit on a national, institutional, and individual level. Insight of dual credit, such as its advantages and limitations, is provided, along with the impact that dual credit has on degree attainment and student success. General themes in the literature include degree attainment and employment, why dual credit programs began, the relationship between degree attainment and dual credit, and student success factors.

Why a College Degree

Job employment and pay can provide support for justifying why students should seek a college degree. Data from the National Center for Education Statistics (2021) shows in 2019, 14 to 34-year-olds had the highest employment rate at 87% when they had obtained a bachelor's degree or higher. Figure 1 provides a breakdown of earnings by degree attainment. Individuals that graduated with some college had an employment rate of 80%, while those who had completed high school had an employment rate of 74% (National Center for Education Statistics, 2021). Those who had not completed high school had an employment rate of 57% (National Center for Education Statistics, 2021).

The National Center for Education Statistics (2021) showed the drive to obtain a college degree had a positive correlation with job attainment and correlated with higher median earnings. In 2018, individuals 25 to 34-year-olds with a master's degree or higher earned a median of $65,000, while those with a bachelor's degree had a median earning of $54,700 (National Center for Education Statistics, 2021). Individuals who completed high school had median earnings of $34,900, while those who did not finish high school made $27,900 (National Center for Education Statistics, 2021).

Figure 1 Median annual earning of full-time, year-round workers ages 25-34, by educational attainment: 2018 (National Center for Education Statistics, 2021).
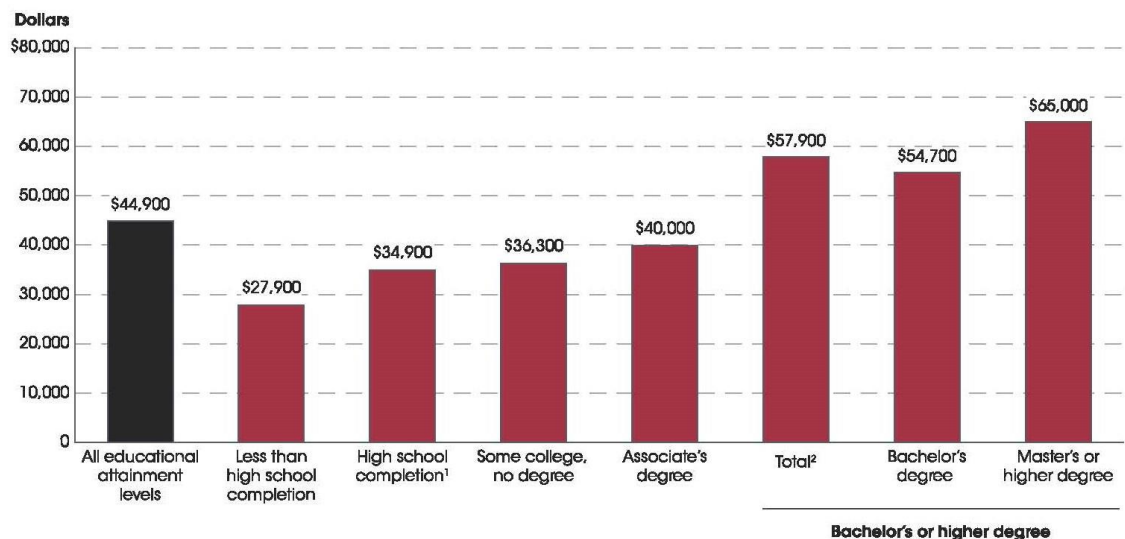
While job employment is a critical factor in why students pursue a college education, soft skills and hard skills are crucial for students to learn while in higher education to assist them in obtaining a job (Stewart et al., 2016). Hard skills allow students to learn the technical aspects of the career they are seeking; these skills have been viewed as required to be competent in that job and are measurable (Stewart et al., 2016). Soft skills may not be as measurable as the often reflect personality traits or attitudes, which makes them hard to measure (Stewart et al., 2016).

Hard skills are being quickly implemented in higher education as an emphasis relies on measurable and specific skills for degrees and careers. One example of a hard skill would be computer literacy or data engineering. While hard skills are essential for career readiness, employers report a lack of soft skills necessary for job roles in college graduates (Stewart et al., 2016). Stewart et al., 2018 highlight common soft skills such as communication, personal relationships, professionalism, teamwork, problem-solving/critical thinking, ethical behavior, flexibility, leadership, and diversity awareness/sensitivity.

Colleges and universities can expose students to these skills through course assignments while also giving students opportunities to be involved with campus groups that foster the previously listed soft skills. Suppose colleges and universities can develop strategies and goals in courses for students to build soft skills concurrently with hard skills. In that case, dual credit students could reap the benefits as well. West Texas A&M University (n.d.a) has developed a mixture of soft and hard skills labeled as marketable skills, which sets an expectation of what students will develop while studying there (West Texas A&M University, n.d.a).

The skills for professional development are critical thinking/problem solving, oral/written communication, teamwork/collaboration, digital technology, leadership, professionalism, work ethic, career management, and global/intercultural fluency (West Texas A&M University, n.d.a). Marketable skills implemented by West Texas A&M University are a good starting point for students to develop some soft skills. While the marketable skills at West Texas A&M University (n.d.) do cover a range of soft skills, the Society for Human Resource Management (2015) lists 10 of the top soft skills that

employers believe college graduates lack as professionalism/work ethic, relationship building/soft skills, business acumen, written communications, critical thinking/problem-solving, leadership, lifelong learning/self-direction, teamwork/collaboration, coaching skills, and flexibility/openness to new experience (Society for Human Resources Management, 2015). Being able to provide dual credit students with job obtainability as well as soft skill and hard skill training are significant reasons for students to pursue a college degree and complete it.

Individuals with experience in higher education are beneficial to economic growth (Carlson & McChesney, 2015). Carlson and McChesney (2015) proposed by obtaining a variety of knowledge and skills that higher education can provide, individuals become more marketable while acquiring more wealth and self-reliance. The reliance on public programs decreases as wealth increases as a result from a college degree (Carlson & McChesney, 2015). Meanwhile, wages and state tax revenues increase in relation to college completion.

Carlson and McChesney (2015) found as education level increases, so does the individual's salary. However, a bachelor's degree is the minimum degree needed for buying power (Carlson & McChesney, 2015). In the research conducted by Carlson and McChesney (2015), salary became more stable with increased educational attainment while the wealth gap also grew, putting degree attainment at a higher priority. Dual credit can provide the resources for students to obtain a degree faster and with less debt.

<u>Dual Credit Then and Now</u>

Typically, dual credit, dual enrollment, and concurrent enrollment all have a synonymous meaning of courses that offer high school students college credit while

enrolled in high school, and college credit has been earned before they graduate high school. For the purpose of this study, dual credit was used as an umbrella term to describe college credit students earn in high school before they graduate from high school. Dual credit allows students to enroll in college courses to earn this college credit which is transferred to colleges and universities so long as the credits are recorded on official transcripts.

The exact start date of dual credit programs is somewhat unclear. Kim et al. (2006) remark on how dual credit may have started as early as the 1970's in the United States, depending on the type of policies the schools implemented. The Texas Higher Education Coordinating Board (2012) has records going back to 1999 reflecting when dual credit in Texas officially began being tracked; it is possible that colleges and universities were accepting dual credit before that time. The Texas Association of School Boards Community College Services (2018) claims that students have received both college and high school credit since the late 1960s.

When first implemented, dual credit had its challenges. Dual credit programs were new and came with criticisms, some of which remain today (Texas Association of School Boards Community College Services, 2018). In the early stages of the dual credit program, professors of colleges were concerned the courses taught by high school teachers would not be as rigorous or their own courses would see a drop in enrollment (Andrews, 2000). Schools did not want their upperclassmen participating in dual credit as students would only receive college credit at the time, and the enrollment numbers would drop (Andrews, 2000). This prevented schools from claiming students and, in turn, prevented the schools from receiving reimbursement for the student (Andrews, 2000).

Meanwhile, colleges that offered dual credit would not claim the hour grant funding if the high schools claimed the students in courses in their daily attendance (Andrews, 2000). In Illinois, this policy changed in the 1997-1998 school year, and students were then allowed to be counted in attendance at the high school while concurrently enrolled in college-level courses (Andrews, 2000). From 1999 to 2000, Illinois saw a 240% increase in dual credit involvement from secondary schools (Andrews, 2000). At this point, the state of Illinois saw a growth in participation from 120 secondary schools in 1996-1997 to 290 in the 1999-2000 school year (Andrews, 2000).

In Texas, 64,910 students participated in dual credit in 2007, and by 2017 there were 151,669 students enrolled in dual credit (Texas Higher Education Board, 2018). This resulted in a 57% growth over those 10 years. Comparing data from 2000 to 2017, the increase of students enrolled in dual credit was 753% (Texas Higher Education Board, 2018). According to the Texas Higher Education Board (2016), *Closing the Gaps* by 2015 was initiated in October of 2000, which put dual credit in the spotlight to close the gaps in higher education regarding participation, success, excellence, and research. Once this program finished in 2015, Texas launched a new initiative to encourage student enrollment in higher education, the 60x30TX (pronounced: 60 by 30 Tex) plan.

The 60x30TX (Texas Higher Education Coordinating Board, 2015c) plan set the target for educational attainment at a benchmark of 48% by 2020. By 2025 the benchmark target is 54%, and by 2030 the goal is that 60% of Texas residents between the ages of 25-34 will have earned a degree or certificate (Texas Higher Education Coordinating Board, 2015a). The Texas Higher Education Coordinating Board (2015c)

set the program's goal to ensure Texas students will be competitive in the global economy. 60x30TX has four main goals:

1. Educated Population
2. Completion
3. Marketable Skills
4. Student Debt

Educated population aims to ensure that 60% of Texans aged 25-34 have earned a certificate or degree (Texas Higher Education Coordinating Board, 2015c). This includes certificates, degrees including associate's, bachelor's, master's, professional, or doctoral. If a resident has more than one degree, then the highest level of attainment will be counted and only counted once in the report (Texas Higher Education Coordinating Board, 2015c). It is important to note this is recording the number of degrees obtained across the state, not the number of students, except for instances where the students are economically disadvantaged (Texas Higher Education Coordinating Board, 2015c). To help push the goal of having 60% of Texans with either a certificate or degree, the Texas Higher Education Coordinating Board (2015c) planned to enhance the academic preparation of K-12. This will come through support and advising to assist in the completion of higher education (Texas Higher Education Coordinating Board, 2015c).

To bolster the number of Texas residents with a certificate or degree, there lies a portion of reliance on individuals that migrate from out of state (Texas Higher Education Coordinating Board, 2015c). The Educated Population goal includes dual credit students who have earned an associate's degree through their studies in high school (Texas Higher Education Coordinating Board, 2015c). The 60x30TX plan does maintain reliance on

dual credit and the success of students enrolled in dual credit programs. As of 2019, 79 community colleges, 29 universities, and 1,650 high schools provide dual credit to students (Miller et al., 2018).

Completion sets a goal of having 550,000 students complete a certificate, associate, bachelor's, or masters in 2030, while 2.7 million Texans aged 25 to 34 will have certificates or degrees by 2030 (Texas Higher Education Coordinating Board, 2015c). This sets a precedent that certifications and degrees completed are from higher education institutions in Texas (Texas Higher Education Coordinating Board, 2015c). From 2015 to 2030, the expectation is to award 6.4 million certificates or degrees (Texas Higher Education Coordinating Board, 2015c). Completion aims to ensure more students are college-ready by their high school graduation (Texas Higher Education Coordinating Board, 2015c). To assist in achieving this goal, 60x30TX targets the promotion of college attainment to students and parents before high school (Texas Higher Education Coordinating Board, 2015c). This campaign can push more high school students to enroll in dual credit courses earlier than their junior or senior year of high school to ensure college readiness.

The overarching goal of 60x30TX ensures educational attainment for 25 to 34-year-olds in the state of Texas. The smaller goal of completion focuses on graduates of Texas colleges and universities (Texas Higher Education Coordinating Board, 2015c). Specifically, the Texas Higher Education Coordinating Board (2015c) lists "Expanding co-requisite course opportunities for developmental education students. These courses allow students to take credit-bearing courses while they take developmental education courses to improve their skills" (p.17). One strategy proposed for completion is to ensure

economically disadvantaged high school students participate in dual credit (Texas Higher Education Coordinating Board, 2015c). Through dual credit programs, institutions and regional programs will connect and support completion while giving the students the opportunity for affordable college degrees (Texas Higher Education Coordinating Board, 2015c). The overarching goal of 60x30TX tracks education attainment of 25 to 34-year-olds, completion focuses on graduates of Texas colleges and universities (Texas Higher Education Coordinating Board, 2015c).

Marketable skills are to be promoted by institutions to ensure students receive various skills that are not already being taught (Texas Higher Education Coordinating Board, 2015c). As skills fluctuate and workplace demand changes and evolves, institutions expect to implement strategies that change and adapt with workplace needs (Texas Higher Education Coordinating Board, 2015c). Through the implementation and building of these skills in college courses, dual credit students should retain and advocate for learned workplace skills just as a college or university student would. To ensure students can utilize workplace skills learned in college as efficiently as possible, one strategy would be to support underprepared students by reducing the time working towards a degree to ensure students persist in completing their degree (Texas Higher Education Coordinating Board, 2015c). Dual credit is one avenue to attain this goal.

The fourth goal of the 60x30TX plan aims to have first-year graduate students of Texas public institutions with 60% of their debt not exceeding first-year wages (Texas Higher Education Coordinating Board, 2015c). Currently, student debt in Texas has risen from 8% to 9% annually (Texas Higher Education Coordinating Board, 2015c). College affordability has largely influenced student debt. In response, 60x30TX addresses

student, university, and state responsibility in minimizing student debt (Texas Higher Education Coordinating Board, 2015c). Texas Higher Education Coordinating Board (2015c) recognizes that to help counter the student loan debt in Texas, it would be beneficial to have students better understand borrowing money and how to manage their time and finances while they are at college and after they graduate. They recommend that colleges should reduce expenses while making it transparent on what students are buying in their educational choices and what impact those choices will have once they graduate (Texas Higher Education Coordinating Board, 2015c).

By helping students develop and understand their educational choices early on, there is an avoidance of excess credit hours, leading to a drop in costs (Texas Higher Education Coordinating Board, 2015c). This issue is highlighted as Texas Higher Education Coordinating Board (2015c) states, "Excessive semester credit hours for degree completion in Texas contribute to student debt and less than timely completions" (p.28). The state can influence student loan debt by funding higher education, which helps students and institutions manage tuition rates (Texas Higher Education Coordinating Board, 2015c). The 60x30TX plan implies higher education can be more affordable and attainable through the reduction of time spent obtaining a degree (Texas Higher Education Coordinating Board, 2015c). Reduced time spent towards obtaining a degree is a significant reason why students enroll in dual credit programs. The 60x30TX plan looks to improve the process of advising students enrolled in dual credit as well as other college prep courses to ensure there is direct enrollment into higher education (Texas Higher Education Coordinating Board, 2015c).

While reservations of dual credit still exist today, the benefits far outweigh the risks. Dual credit can help ease the transition from high school to college while reducing fear and anxiety students may experience in their transition to college as it provides them with insight on for college courses (McGowan Bucci, 2020). Based on the Texas Higher Education Coordinating Board (2021) data report *Dual Credit and Total Enrollments, Fall Semesters*, students were willing to put aside their reservations of dual credit and enrolled in offered programs considering dual credit enrollment increased from the fall of 2018 of 185,255 students to the fall of 2019 with 202,417 students. From the fall of 1999 to 2019, there was an increase of 190,496 students.

Ultimately, colleges and universities began to benefit from their enrollment and retention rate, while dual credit has become the norm. This became especially true when colleges realized how fundamental dual credit could predict student performance when they started full-time at a college or university (McGowan Bucci, 2020). Although dual credit may present some challenges and advantages, students are taking advantage of the programs offered.

<div align="center">Limitations of Dual Credit</div>

Dual credit has been beneficial to students across the nation; however, it is not without its hindrances or criticisms. While interviewing dual credit students, Kanny (2015) found the following three themes of dual credit hindrances emerging in their research:

1. Issues in credit and grades
2. Negative interactions with others
3. Limited support

As the main reason for enrolling in dual credit programs is to gain college credit, it is understandable that students would become disgruntled when the credit did not transfer or did not count for high school hours (Kanny, 2015). Students expressed concern about unexpected grades while taking dual credit courses. However, the students in Kanny's (2015) study were considered capable of handling dual credit courses. A portion of students reported receiving the lowest grades of their high school career in their dual credit courses (Kanny, 2015). With low grades, the students became concerned their now lowered GPA would hinder them in their goals of having a more accessible admittance into college after they graduate high school. This concern fostered a sense of anxiety and uncertainty in their college goals (Kanny, 2015).

Views that the peers of students enrolled in dual credit had played a significant role in whether or not the students continued with their courses (Kanny, 2015). One student remarked they had stopped taking dual credit courses as their peers negatively viewed their nontraditional status (Kanny, 2015). At this point, the student no longer wanted to take part in the courses and sought a more traditional high school experience (Kanny, 2015). Students also reported their instructors indicated teaching high school students was a burden as they were less mature (Kanny, 2015). This hostility prevented the students from asking questions or actively involving themselves in the class as they were unsure of the response they would receive (Kanny, 2015).

In the survey researched by Kanny (2015), students reported instances of having limited support systems. Once students enrolled in their dual credit course, there was limited interaction with high school personnel that could assist them with their courses (Kanny, 2015). A majority of the students' accounts referenced not feeling pressure to

turn in assignments as they were left on their own to figure out how to navigate and plan

for college courses (Kanny, 2015). Kanny (2015) reported at times, students just did not

feel they had the background knowledge to perform in the class adequately and began to

feel isolated as they struggled to keep up with the knowledge presented. Before, the

students had ample access to tutors and high school counselors but found they were of

little use with their college courses (Kanny, 2015). Meanwhile, the college had no

support for the students besides the professors who had already made the students feel

they could not receive help from them (Kanny, 2015). Hughes (2010) noted some

students enrolled in dual credit courses, where they attend college courses on campus,

without the professors being aware of a high school student in their class. This can make

it difficult for the student to receive the help they need if the college cannot effectively

communicate with the student's high school regarding expectations and support available

to students (Hughes et. al., 2012a).

McGowan Bucci (2020) noted community colleges may view students going

directly to a university after completing high school credit as a disadvantage. By

completing dual credit in high school, students may experience a heightened sense of

confidence and choose to enroll in a university right away instead of a community college

(McGowan Bucci, 2020). This is especially true if students would traditionally go to

community college gain enough college credit through dual credit, they do not need to go

to community college (McGowan Bucci, 2020).

In a study conducted by Fink et al. (2017), 30% of dual credit students enrolled at

a community college, 48% enrolled at a university first enrolled at a college, and 22% did

not register at any college after taking dual credit courses. However, this data is based on

student age and enrollment time and not on the high school graduation date and college enrollment date (Fink et al., 2017). This study also found that 84% of dual credit students enrolled at the community college that they participated in dual credit from while 41% of students took dual credit enrolled at a university (Fink et al., 2017). Universities may have their concerns regarding the rigor presented in the dual credit courses.

Since students in Texas are able to start dual credit courses in ninth grade, the academic preparation for ninth and tenth graders has declined but those passing dual credit courses has increased (Miller et al., 2018). This has led researchers to believe rigor of dual credit courses may have declined, at least for those in ninth or tenth grade (Miller et al., 2018). Having college courses of less quality could give dual credit students an unrealistic idea of college courses if the rigor of the courses is not upheld. As Klopfenstein & Lively (2012) state, "These college-level programs can provide the target of high standards, but true readiness comes from the mechanisms through which students are supported in their efforts to reach college-level standards" (p. 66). Day et al. (2020) stated that

> "College faculty, unfamiliar with teaching high school students, may struggle with how to engage students and what level of support to provide to them to ensure college success without compromising academic rigor but the findings of this study found college faculty who teach Dual Enrollment students to produce students who are more satisfied, more independent, and more responsible." (p. 15)

Funding for dual credit courses can be viewed as a hindrance for some students. School districts and colleges can receive state funding for dual credit courses, but the decision of who pays tuition, fees, and other costs is made at the local level (Texas

Education Agency, 2020). West Texas A&M University charges $150 per course, which gives students an ID card, email account, and access to the library and computing services (West Texas A&M University, n.d.b). Students are also responsible for purchasing textbooks and other course materials if required and not included with the course charges. While West Texas A&M University (n.d.b) charges on a per course basis for dual credit, Amarillo College charges on a per-credit basis which is $50 per credit hour (Amarillo College, n.d.a). Students enrolled through dual credit at Amarillo College have access to their library, career services, disability services, computer labs, and tutoring (Amarillo College, n.d.b). While these rates are reduced compared to the standard course charge, students who have to pay out of pocket for these courses could find it challenging to enroll if they are economically disadvantaged.

<center>Advantages of Dual Credit</center>

College credit through dual credit programs is offered at a lower rate or no cost depending on the institution (Texas Education Agency, 2020) while providing an opportunity for students to finish their degree sooner. Students who are low-income would benefit from dual credit programs that offer reduced or free tuition rates as they may not have the same opportunities when dual credit programs are conducting outreach (Karp et al., 2007). Underrepresented students may not be aware of dual credit opportunities that offer college courses at a reduced rate or for free, which would benefit this population of students.

Students can accumulate various college courses while in high school, allowing them to save money long term by reducing the time the student is at an institute of higher education and providing them with a reduced cost (Zeidenberg & Bailey, 2010; Karp et

<center>24</center>

al., 2007). Taking dual credit courses at reduced rates has allowed students to minimize the total cost of their enrollment to a higher institution. It was found that dual credit students complete a bachelor's degree one year sooner, and those who completed an associate degree completed it nearly two years earlier on average than those who did not participate in dual credit courses provided in a report by the National Student Clearinghouse Research Center, in a study conducted by Shapiro et al. (2016).

As mentioned in the section *Why a College Degree*, having an educated workforce benefits the states. Zeidenberg and Bailey (2010) note community colleges have a lower tuition rate as states want students to access affordable college options. By offering dual credit through community colleges, students can take advantage of the lower tuition rates with the possibility of having a reduced tuition rate if there are grants and other funding available to them (Zeidenberg & Bailey, 2010). Troutman et al.(2018), found 12% of students paid more than $200 per course of those taking dual credit, while 51% received free dual credit courses. While students may have received reduced or free base tuition, some schools or districts leave the cost of textbooks or other fees for the student to cover. While there have been significant studies indicating the benefit of dual credit courses on reducing student loans, Troutman et al. (2018) found that unless students have 60 or more credit hours, there is no significant impact on student loan debt. However, this did take into account financial aid packages, tuition waivers, scholarships, and total grants, which may not be available to all students (Troutman et al., 2018).

As one of the most cited reasons for participating in dual credit, researchers have found that dual credit does have an impact on GPA in either college or high school (Allen & Dadgar, 2012; Peng, 2003; Puyear et al., 2001; Troutman et al., 2018; Young Jr. et al.,

2013). Troutman et al. (2018) found that students with dual credit have a higher cumulative GPA compared to students with no dual credit. Dual credit students obtained a higher first, second, and third-year GPA compared to students with no dual credit (Troutman, 2018). While dual credit can positively impact dual credit at a higher education institute, students have found that dual credit can also positively impact their high school GPA as dual credit courses give additional weight when factoring for GPA (Troutman, 2018). While students with dual credit are likely to receive a first-year GPA higher than those without dual credit, students with dual credit are less likely to take remedial courses due to their exposure to college courses (Tobolowsky & Allen 2016).

Dual credit courses provide a unique opportunity for students to experience what a college course is like before they enroll at a university or institution where the credit hours and fees could cost significantly more. Depending on the dual credit course delivery, students may have the added benefit of being exposed to a college classroom environment when they attend the course on campus (Tobolowsky & Allen, 2016). This becomes evident as Tobolowsky & Allen (2016) states that "dual enrollment can be an introduction that helps them understand what college requires and offers and may enhance aspirations and encourage future college attendance by showing them they are indeed capable of doing college-level work" (p. 3). According to Tobolowsky & Allen (2016), dual credit not only exposes students to college coursework but can encourage and serve as motivation for students to continue into higher education by giving them the confidence needed to be successful. Bailey et al. (2002) recognize the benefit of student exposure and the ability to gain experience of a college course while gaining credit for both college and high school courses. Dare and Nowicki (2015) found in a survey of

students enrolled in dual credit, Prepare for University ranked the highest as motivation

to enroll in dual credit courses. The desire by students to gain experience to prepare for

university is represented in the cluster map demonstrated in Figure 2.

Figure 2 Cluster map showing conceptualization of concurrent enrollment. (Dare and

Nowicki, 2015).
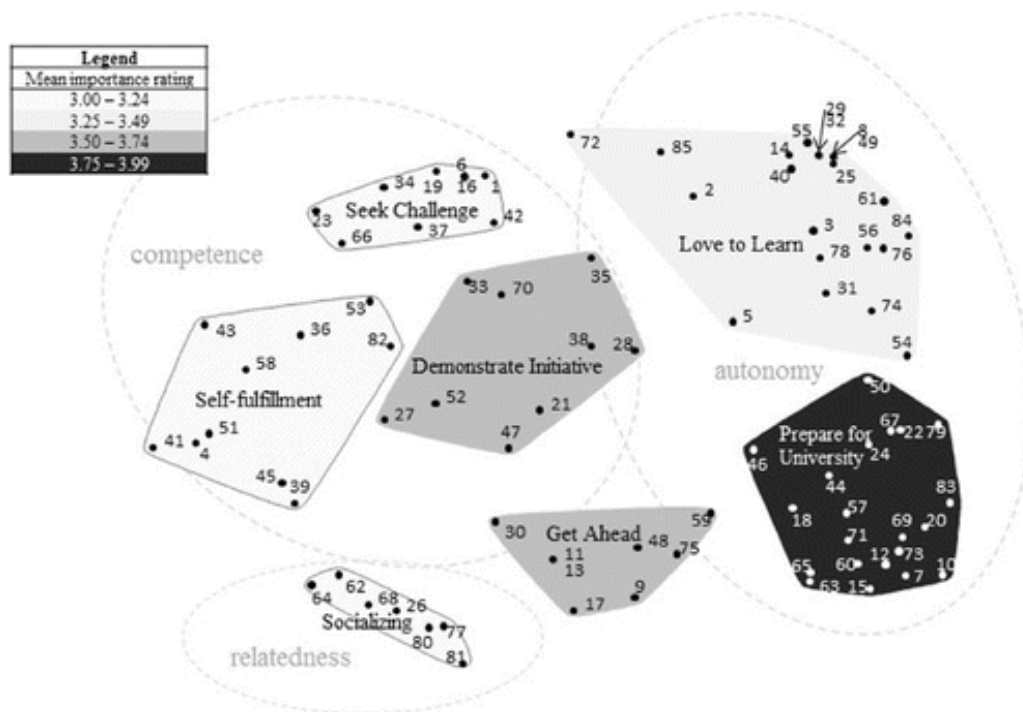
Student Requirements for Enrollment

In Texas, for a high school student to participate in a dual credit program, students

can be in grades 9 – 12, and if they meet the academic performance standards (Texas

Education Agency, 2020). To measure academic success, grade point average,

PSAT/NMSQT scores, and PLAN or other assessment indicators for the waiver to be

utilized. The PSAT is also known as the SAT or preliminary SAT (What is the PSAT?,

2019), where the highest possible score is 1520. The NMSQT is the National Merit

Scholarship Qualifying Test, a practice version of the SAT. Requirements may vary

depending on the type of college course being offered. Colleges and high schools offering

dual credit can add further requirements to take the college courses, given they do not

conflict with the state regulations on dual credit (Texas Education Agency, 2020).

High school students from the 9th – 12th grade that meet the eligibility

requirements through the Texas Success Initiative (TSI) or eligibility requirements for

dual credit can enroll in courses for dual credit (Texas Education Agency, 2020). Figure 3

lists the requirements needed to be considered college-ready, while Figure 4 lists the

criteria to be dual credit eligible (Texas Education Agency, 2020). If a student can meet

one of the benchmarks listed in Figure 3 for TSI and be considered college-ready, they

may be eligible for dual credit courses. While students may not be considered college-

ready, they may be considered eligible to enroll in dual credit courses and then

categorized as dual credit ready once they receive a passing letter grade in mathematics

or reading and/or writing-intensive college-level course (Texas Education Agency, 2020).

Figure 3 Minimum Passing Standards to Demonstrate College Readiness (TEA Dual Credit FAQ, 2020).

	Assessment	To Qualify for Math Courses		To Qualify for English Courses*				
		Math/ Algebra	Combined/ Composite	ELA/Reading Skills	Objective Writing/ Sentence Skills	Writing/ Essay	Evidenced Based Reading & Writing (EBRW)	Combined/ Composite
Academic Courses	ACT	19	23	19	-	-		23
	SAT (prior to 3/5/16)	500		500 (formerly verbal)				1070
	SAT (after 3/5/16)	530					480	
	TAKS[1] (11th grade)	2200		2200		3		
	STAAR EOC Algebra II	4000						
	STAAR EOC English III			4000				
	TSI Assessment (prior to 9/28/2020)	350	-	351	340 + <340 (ABE Diagnostic of 4 +	4 5		
	TSI2 Assessment (after 9/28/2020)	TBD September 2020		TBD September 2020 **	TBD September 2020 **			

*Students must meet both subject and composite score standards where both are listed.

**TSI2 will combine the reading and writing tests to one English Language Arts Reading (ELAR) test, with one college readiness benchmark, plus essay score.

Figure 4 Minimum Passing Standards to Demonstrate Dual Credit Eligibility (TEA FAQ, 2020).

		To Qualify for Math Courses		To Qualify for English Courses				
	Assessment	Math/ Algebra	Combined/ Composite	ELA/Reading Skills	Objective Writing/ Sentence Skills	Writing/ Essay	Evidenced Based Reading & Writing (EBRW)	Combined/ Composite
Academic Courses and Assessments	TAKS[2] (11th grade)	2200		2200		3		
	PSAT/ NMSQT[3] (prior to 10/15/15)	50	107	50				107
	PSAT/ NMSQT[4] (after 10/15/15)	510					460	
	PLAN (Pre-ACT)	19	23	19				23
	ACT ASPIRE	431		435				
	STAAR EOC English II			4000				
	STAAR EOC Algebra I and passing grade in Algebra II Course	4000						

While the state does have a limitation of two dual credit courses per semester, students may be exempt from this if they meet the requirements, the student displayed outstanding academic performance, and the high school principal as well as the chief academic officer of the college approves the student's participation in the courses. If a student enrolled in an approved Early College High School, then the individuals may be exempt from the two dual credit courses per semester rule.

Academic performance is the first factor implemented to ensure student readiness for dual credit courses. Participants in McGowan Bucci's (2020) survey cited challenges in teaching students that were not ready for the pressures or time dedication needed for college courses. However, McGowan Bucci (2020) found a portion of dual credit educators marked significant challenges in teaching students were not ready for dual

credit courses despite their academic performance and approval from office administrators.

While academic performance can give an idea of how a student may perform in dual credit courses, it is harder for schools and teachers to measure student's maturity. One educator remarked on how student's maturity can be a detriment when it comes to dual credit course expectations. (McGowan Bucci, 2020). Pressure from administration and parents can cause issues for student ownership in dual credit courses (McGowan Bucci, 2020) To combat pressure from both entities, suggestions of clear expectations for success in the class, and the repercussions of lower academic performance were made to ensure student preparation for the course (McGowan Bucci, 2020).

While Texas sets specific academic benchmarks to ensure student readiness, student maturity was not significant. Even though a student may be academically ready for the course, that does not equate to student preparedness for the social and environmental challenges presented in dual credit courses (McGowan Bucci, 2020). Hughes & Edwards (2012) found two challenges in their study from the instructors' perspective. The first is the students' lack of academic skill, while the other challenge is adjusting to college courses' college environment. Hughes & Edwards (2012) identified five critical academic behaviors students lack, of which academic performance does not account for. The academic behaviors included:

1. Out-of-Class Study
2. Class Participation
3. Time Management
4. Stress Management

5. Note Taking

Lack of these behaviors coupled with a gap in academic skills needed to succeed made dual credit courses a challenge for the students (McGowan Bucci, 2020). State standards set the baseline for student enrollment in dual credit courses, while the administration has the task of determining students' preparedness for the courses from performance in previous courses, which may not require the same dedication as future courses. Garcia et al. (2019) conducted a similar study that found that dual credit students struggle to gain academic and social maturity when they transition from dual credit courses to college campuses for the first time.

<u>Factors of Student Success</u>

As previously mentioned, dual credit is frequently attributed to academic success when students start their college careers (Troutman, 2018; Puyear et al., 2001; Young et al., 2013). Looking at this more closely, researchers must determine what motivates high school students to enroll in dual credit and what other factors positively correlate with academic success in college students.

Motivation can serve as a vital source for dual credit enrollment and completion in students. It has been postulated by Dare and Nowicki (2017) that students prefer to take dual credit during their senior year to help ward off senioritis or disengagement while motivating them to achieve higher grades before they transitioned to college proactively. Student motivation has been a strong factor in why students take dual credit courses to help them obtain a college degree.

Motivation to complete dual credit can be intrinsic or extrinsic as students reflect on reasons why they enrolled in dual credit in the first place. Dare et al. (2017) have

shown through the use of a cluster map that students often remarked that dual credit allowed them to explore their love of learning and get ahead in their college careers while providing confidence in their ability to get ahead into the program. Educators of these students agreed that students pursued dual credit as they loved to learn and were planning ahead for their college careers. Figure 4 illustrates Dare et al., (2017) findings on student reasons for enrolling in dual credit.

Figure 5 Educators' and students' categorizations of students' reasons for concurrent enrollment (Dare et al., 2017).
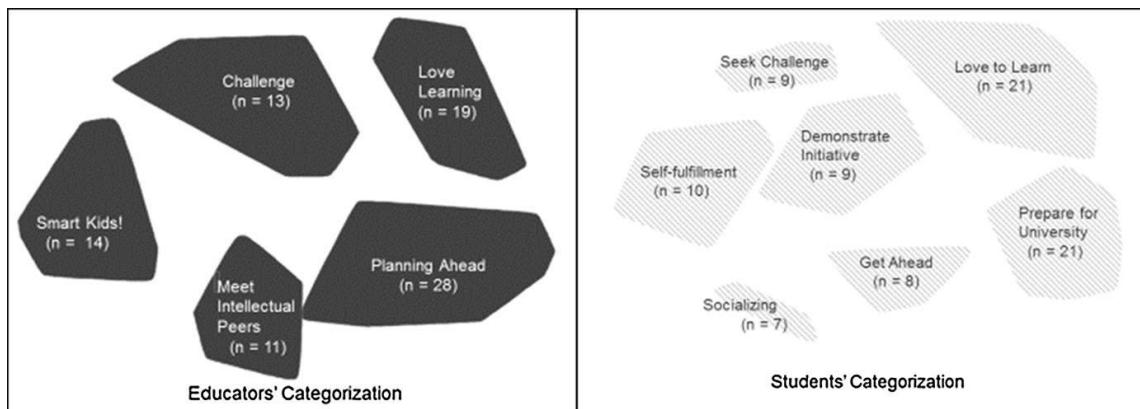
Klopfenstein and Lively (2012) confirms this when comparing dual credit students to AP students as "Either dual enrollment does a better job bringing along middle-achieving students, or students who participate in dual enrollment are stronger than AP students in terms of their unobservable characteristics, such as motivation" (p.64).

Learning strategies have their significance for currently enrolled students in dual credit courses. While dual credit courses experience and time to develop learning strategies, Day et al. (2020) found that students with nine or more credit hours utilized the highest learning strategies. Self-efficacy and intrinsic goal orientation significantly

increased after students completed 16 or more dual credit hours (Day et al., 2020). When college faculty taught the course, student self-efficacy and self-regulation increased (Day et al., 2020).

Regarding college students, self-efficacy plays a significant role in determining their first-year GPA. Han et al. (2017) conducted a study to assess student mindset effects regarding students' academic achievement and retention. Through the examination of 1,400 students, four profiles emerged. All high, self-efficacy orientated, belonging oriented, and all low each frame the students into their respective cluster (Han et al., 2017). Students believed most likely to succeed in their academic careers were categorized into the all high group, whereas students in the all low group were the least likely to succeed. The study conducted by Han et al. (2017) reported self-efficacy as highly associated with academic performance while the profile of belonging was highly associated with retention. Students that were highly self-efficacy orientated achieved a higher GPA their first term at college (Han et al., 2017). This self-efficacy was associated with the student's belief in their own belief regarding being academically successful (Han et al., 2017).

In first to second-year retention, a sense of belonging was a significant factor right after the determination of the all high group remaining at the top for retention (Han et al., 2017). Those in the all high group did have the highest retention rate (Han et al., 2017). A sense of belonging may have served as a pivotal point in which students decided to stay at a university, even though there may not have been a direct association to academic success in their first year (Han et al., 2017). Providing orientations and an assortment of

resources to bolster student success encouraged retention of students as it increased their sense of belonging (Han et al., 2017).

Webber et al. (2013) postulate that students may not be as highly involved as researchers believe is necessary for academic success. In their research, Webber et al. (2013) found that students who were involved in social activities and engaged in academic activities received higher grades and achieved higher levels of personal satisfaction. Webber et al. (2013) state, "When faculty and institutional emphases create a culture of open dialogue, challenge students academically, and support active and collaborative learning techniques, students may benefit with increased academic knowledge as well as personal and social goals" (pg. 604-605).

Day et al. (2020) determined that students who participated in courses on the physical college campus scored highly on help-seeking factors and effort regulation. Webber et al. (2013) found that first-year students were more likely to view university support and cumulative GPA negatively. However, Webber et al. (2013) attributed this to the possibility that students may have needed more academic assistance than what they were accustomed to and being uncomfortable in asking for help from their academic advisors. While dual credit does provide students with exposure to college courses, it does not provide experience in asking for help from academic advisors or educators at the collegiate level if the course is solely taken through and at the high school.

Kuh et al. (2008) found that student academic outcomes positively correlated with participation in campus activities. While ACT and SAT scores positively impact first-year grades and persistence, these pre-college characteristics diminish as college experiences become a significant factor in first-year rates and persistence (Kuh et al.,

2008). Staying involved on campus is highly correlated with academic achievement and retention. Kuh et al. (2008) found that students become more invested in activities and their college and their studies when they have to take responsibility for activities that require daily decisions and tasks.

A study conducted by Lotowski et al. (2004) for the 2004 ACT Policy Report recognized five non-academic factors that can impact retention and academic outcomes as:

1. Academic Self-Confidence
2. Achievement Motivation
3. Institutional Commitment
4. Social Support
5. Social Involvement

Academic self-confidence measures how successful the student believes they will be within an academic environment (Lotowski et al., 2004). Lotowski et al. (2004) found that self-confidence had a strong relationship with retention; it also displayed a strong relationship with college GPA. Achievement motivation is the level of motivation a student had to achieve success (Lotowski et al., 2004). This factor had a weak relationship with retention but a strong relationship with college GPA (Lotowski et al., 2004). Institutional commitment encompasses the level at which students are confident and satisfied with their chosen institution (Lotowski et al., 2004). Lotowski et al. (2004) found that this non-academic factor had a moderate correlation with retention and college GPA. Social support, defined by Lotowski et al. (2004), is the level of support that the student feels college provides, not necessarily all the support the college offers. Social

support as a non-academic factor has a moderate relationship with retention and college GPA (Lotowski et al., 2004). Social involvement varies slightly from social support as Lotowski et al. (2004) define it as the "Extent to which a student feels connected to the college environment, peers, faculty, and others in college, and is involved in campus activities" (pg. 6). Lotowski et al. (2004) found that social involvement had a moderate relationship with retention and college GPA.

Krumrei-Mancuso et al. (2013) researched the impacts of six psychosocial factors and their impact on academic success and retention. Psychosocial factors researched were: academic self-efficacy, organization and attention to study, stress and time management, involvement with college activity, emotional satisfaction with academics, and class communication (Krumrei-Mancuso et al., 2013). Academic self-efficacy is defined by Krumrei-Mancuso et al. (2013) as to how self-aware students regarded their academic ability, efforts put forth to study, and the student's expectation of attaining college success was. Academic self-efficacy was determined to predict first semester GPA the strongest (Krumrei-Mancuso et al., 2013). Organization and attention to study, how students make study goals and implement them while balancing pressures of time and academic activities, closely followed academic self-efficacy in determining first semester GPA (Krumrei-Mancuso et al., 2013).

Krumrei-Mancuso et al. (2013) define stress and time management as to how students respond to the pressures of time, environmental concerns, and academic demands to prevent themselves from being overwhelmed. Involvement with college activity involves participating in activities and organizations on campus (Krumrei-Mancuso et al., 2013). Emotional satisfaction is how interested and fulfilled the students

are in their academic lives and emotional responses (Krumrei-Mancuso et al., 2013).

Krumrei-Mancuso et al. (2013) define class communication as to how students

communicated with verbal or non-verbal cues to engage in classes and activities. The

defined psychosocial variables of stress and time management, involvement with college

activity, and emotional satisfaction with academics were significant variables to predict

life satisfaction for college students (Krumrei-Mancuso et al., 2013). Meanwhile, class

communication was not a significant factor in determining college life satisfaction or

GPA (Krumrei-Mancuso et al., 2013).

While dual credit has served as a predictor of academic success (Troutman et al.,

2018; Puyear et al., 2001; Peng, 2003; Young Jr. et al., 2013), it is not the only variable

that can impact a student's success and preparedness for college.

<div align="center">Conceptual Framework</div>

Considering the research regarding the effect of dual credit on academic success

as measured by first-year GPA, there was interest in determining how West Texas A&M

University can determine this relationship within first-year students of the 2018-2019

cohort. To do this, the following quantitative framework developed from the quantitative

frameworks presented above and analyzed a large-scale administrative data set provided

by West Texas A&M University. The analysis used non-experimental methods by

utilizing a stepwise regression through the IBM Statistical Package for Social Sciences

(SPSS) after the determination that the given data was not linear.

Microsoft Excel 2016 was utilized to evaluate student characteristics, allowing

researchers to compare academic success between and within specific groups. Pivot

tables provided insight into the student characteristics while demonstrating various

information regarding student retention and performance. This allowed researchers to build and utilize charts relevant to the study by showcasing different phenomena and occurrences.

Summary

Existing research showed a consistent need to identify how beneficial dual credit hours are to student academic success. When student academic success and retention are impacted by dual credit hours, explaining the variance between admissions standards and student achievement is a priority for institutions. However, high school GPA is considered the most reliable variable for predicting first-year college success and can be heavily influenced by dual credit. This creates a need in determining how large of an influence dual credit has on first-year college students' academic success.

Research regarding the number of dual credit hours taken and how those hours impact academic success can shed light on this. The question is not "will dual credit help students be academically successful their first year of college?", instead it is "how many dual credit hours is required of students to ensure they are successful in college." Examining how the number of dual credit hours taken impacts student success gives a unique insight into the first-year success of college students and should determine how students communicate whether or not it is a significant dividing factor of dual credit students.

The significant amount of research done on the benefits of dual credit on academic success leaves room for understanding how significant those benefits are. This research will evaluate dual credit hours of the 2018-2019 first-year student cohort to conceptualize the balance between the number of dual credit hours taken and its impact

on academic success while evaluating student characteristics and retention rates. Researching the impact of dual credit hours may provide insight into how to improve recommendations given to high school students by providing those in a position to understand better just how successful dual credit is after their first year at college.

CHAPTER III

METHODOLOGY

Overview

The previous two chapters discussed the history and context behind dual credit, its relationship in obtaining a degree, the impact it has on academic performance, and why students choose to enroll in dual credit courses. Chapter I introduced the topic of dual credit and programs that encourage dual credit enrollment that were crucial in relation to this study as more students enrolled in dual credit programs. Chapter II discussed relevant research regarding this institutional, state, national, and individual interest in dual credit through previous research. Insight towards non-cognitive factors, such as motivation, was provided, along with student and educator insight research as they related to future impacts of dual credit included in this study. Additionally, academic success, retention, and classification between dual credit ranges were specifically reviewed. This chapter describes the research design, population, instrumentation, data collection, and statistical analysis.

Purpose and Questions

This research sought to determine if there is an effective range of dual credit hours which determines academic success. Additionally, students' individual college was taken into consideration to determine how the impacts of dual credit differentiate between

colleges. In order to determine the success of the students, the researchers measured academic performance in the students' first year at WTAMU. Characteristics and relationships in the 2018-2019 first-year student cohort were determined using the following research questions:

1. Is there a difference in first-year academic success when comparing students with dual credit to those without dual credit?

2. Do dual credit hours correlate with first-year GPA?

3. Is there a significant change in academic success depending on the number of dual credit hours a student took?

4. What are the characteristics of students retained at WTAMU compared to those who departed from the university?

The conceptual framework of this study was based on the research conducted by Fink et al. (2017) regarding participation of dual credit in high school students, An's (2015) study of motivation and engagement, McGowan Bucci's (2020) research on student's perspectives of dual credit, and Jones' (2014) research on dual credit in relation to college success.

<div align="center">Research Design</div>

This quantitative, non-experimental, ex post facto study was built to gather more information about the 2018-2019 first-year student cohort at West Texas A&M University and used a descriptive-correlation research design. The study was designed to evaluate the impact of dual credit on first-year student success as well as other factors that may be influenced by dual credit such as classification and retention. GPA was the measurement used to determine academic success in their first year of university courses.

Students who maintain a 2.0 or higher are deemed successful while those who drop below this marker are considered unsuccessful as they may receive an academic warning, probation, or suspension depending on student status as described by West Texas A&M University (n.d.c). On a national level, the average GPA for students was a 3.0 for public institutions (Rojstaczer & Healy, 2010) and researchers used this average to compare academic success at West Texas A&M University to the national average.

While the measurement of academic success can vary, GPA scores were utilized to determine student success in first-year college students while ACT and SAT scores were utilized for the purpose of determining the qualifications of students enrolled in dual credit courses. The ACT test was the most widely taken exam among the sample population. According to the data provided on the 2018-2019 first-year cohort, 658 ACT scores were submitted for admission, whereas 482 SAT scores were submitted for admission. The average SAT score was 1063, while the average ACT score was 21. The dependent variable measured in this study was first-year student success. First-year GPA is the measurement used as the factor for success, which was obtained through institutional data. Dual credit hours do not count towards first-year GPA. Rather, first-year GPA is determined by the cumulative GPA received from the first and second semester at West Texas A&M University.

<u>Student Selection</u>

The population for this study was 2018-2019 first-year students, with specific emphasis on capturing differences in credit range that dual credit students were enrolled in. A request for data was sent to the Department of Institutional Research and Effectiveness regarding first-year students. Additionally, demographics regarding age,

gender, race, and college were requested. The data received detailing the 2018-2019 first-year cohort consisted of 2,000 students, of which 972 students were included in this study.

The 972 students were randomly selected after students were divided into three categories. The first group consisted of students with no dual credit. Group 2 consisted of students with three dual credit hours to 18 dual credit hours. The third group consisted of students with 19 dual credit hours or more. To determine the students included in this research, the RAND() function was utilized in Microsoft Excel which assigned a randomized number to each student. Once assigned a random number, the groups were sorted in numerical order from lowest to highest. The breakdown of 324 students per group was selected as the upper limit as it was a natural break for each of the groups. To determine the break between students with dual credit, 18 credit hours was chosen as a breakpoint since it was the median number for students with dual credit hours. The following descriptions cover the 972 students included unless otherwise noted. Students are numerically represented with an individual identification number as all personally-identifying information was scrubbed.

It should be noted that 71 students were removed before being divided into groups as they were enrolled in a homeschool program, a college preparatory program, foreign high school, their high school graduation date was missing or they received college credit after graduating from high school but before enrolling at West Texas A&M University. Homeschool students were excluded as the study focuses on students enrolled in a public high school that would have similar resources and difficulties of balancing high school expectations as well as dual credit expectations. College preparatory students were also

excluded as the schools are focused on college preparation while dual credit submersed the students into a college course through a designated college or university while balancing high school courses and activities. Students previously enrolled at a foreign high school were excluded for the same reasons listed for homeschool students as well as the uncertainty of how dual credit was obtained and what differences may be presented in courses abroad versus in the United States. Students with a missing high school graduation date, or who had college credit earned after their high school graduation date were removed due to uncertainty of whether or not the student was enrolled concurrently in high school and college courses.

Sample

Of the 972 students included in this study, 544 (55.97%) students were female and 428 (44.03%) were male. The average age was 18.17 years old. 324 (33.33%) students had not earned dual credit while 648 (66.67%) students had earned dual credit. The average GPA was 2.79. In the 972 student sample, 845 students came from high schools in Texas, whereas 127 came from schools out of state. Individual college is reported below:

1. Agriculture and Natural Sciences – 270 (27.78%) Students

2. Business – 102 (10.49%) Students

3. Engineering, Computer Science and Mathematics – 113 (11.63%) Students

4. Education and Social Sciences – 99 (10.19%) Students

5. Fine Arts and Humanities – 146 (15.02%) Students

6. Nursing and Health Sciences – 178 (18.31%) Students

7. Undeclared/General Education – 64 (6.58%) Students

This breakdown is exemplified in figure 6.

Figure 6 College Breakdown of First-Year Students at West Texas A&M University
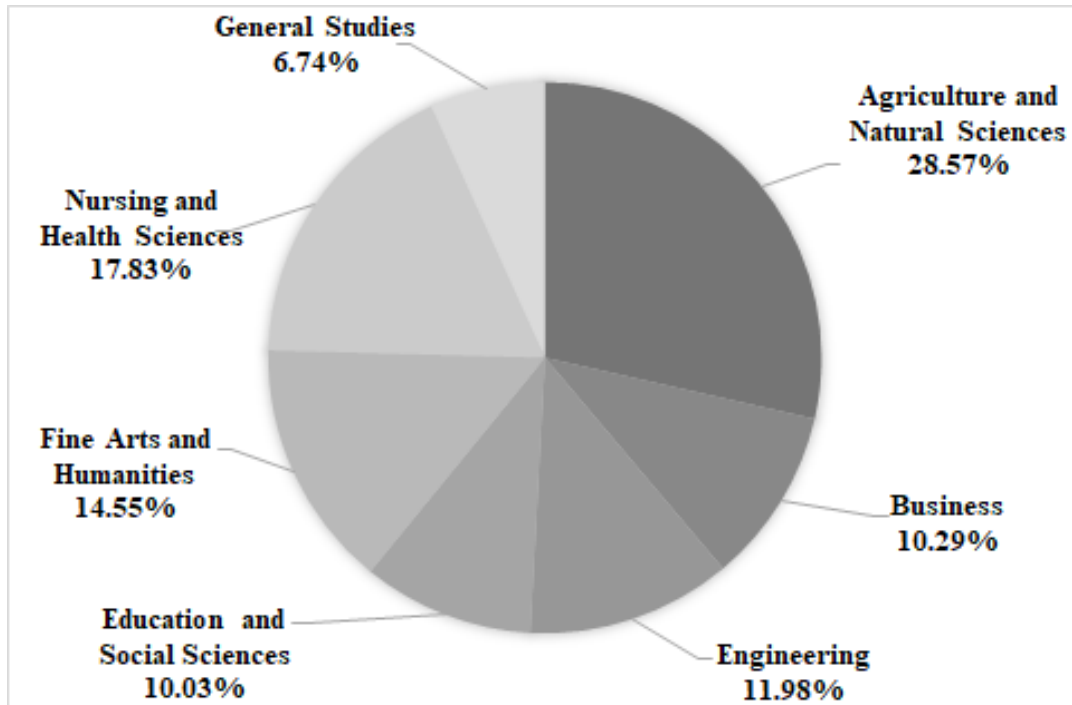
For the 2018-2019 school year, first-year students varied in ethnicity at West Texas A&M University including 57 (5.86%) African Americans, 4 (0.41%) Asians, 279 (28.70%) Hispanics, 40 (4.12%) students of Multiple Races, 5 (0.51%) Native Americans, 13 (1.34%) students with Unknown Ethnicities, and 574 (59.05%) students were White. Visual representation of the ethnic groups is displayed in Figure 7. The majority of students with dual credit were classified as freshmen (0-29 credit hours) which included 869 (89.40%) students. The sophomore classification (30-59 credit hours) consisted of 96 (9.97%) students while juniors (60-90 credit hours) made up 7 (0.72%) of the 2018-2019 first-year student cohort. Of the students included in this study, 261 (26.85%) departed from the university while 711 (73.15%) students were retained after their first year at West Texas A&M University.

Figure 7 First-Year Student Ethnicity at West Texas A&M University
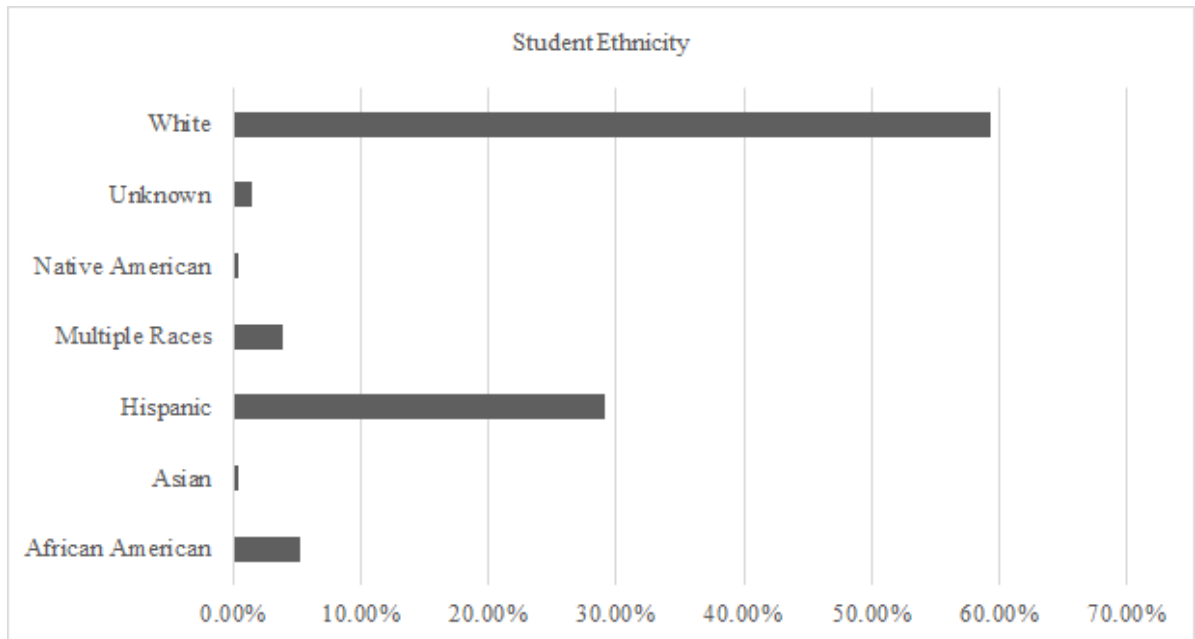
Group 1

Group 1 represented students with no dual credit. 166 (51.23%) students were female and 158 (48.77%) were male. The average age was 18.23 years old. The average first-year GPA for Group 1 was 2.41. Of the students in Group 1, 279 (86.11%) came from a high school in Texas, while 45 (13.89%) came from an out-of-state high school. Group 1 students were all classified as freshmen. Individual college is reported below:

1. Agriculture and Natural Sciences – 82 (25.31%) Students

2. Business – 34 (10.49%) Students

3. Engineering, Computer Science and Mathematics – 33 (10.19%) Students

4. Education and Social Sciences – 43 (13.27%) Students

5. Fine Arts and Humanities – 50 (15.43%) Students

6. Nursing and Health Sciences – 55 (16.98%) Students

7. Undeclared/General Education – 27 (8.33%) Students

For Group 1, first-year student ethnicity in Group 1 at West Texas A&M University included 40 (12.35%) African Americans, 3 (0.93%) Asians, 112 (34.57%) Hispanics, 18 (5.56%) students of Multiple Races, 0 (0.00%) Native Americans, 8 (2.47%) students with Unknown Ethnicities, and 143 (44.14%) students were White. In Group 1, 147 (45.37%) students departed from the university while 177 (54.63%) students were retained after their first year at West Texas A&M University.

Group 2

In Group 2, 179 (55.25%) students were female and 145 (44.75%) were male. The average age was 18.17 years old. Students in Group 2 ranged in hours from 3-18 credit hours. Students in Group 2 were also classified as Freshmen which includes 324 (100%) students. Of the students in Group 2, 280 (86.42%) came from a high school in Texas, while 44 (13.58%) came from an out-of-state high school. The average first-year GPA was 2.79. Individual college is reported below:

1. Agriculture and Natural Sciences – 89 (27.47%) Students

2. Business – 33 (10.19%) Students

3. Engineering, Computer Science and Mathematics – 34 (10.49%) Students

4. Education and Social Sciences – 36 (11.11%) Students

5. Fine Arts and Humanities – 49 (15.12%) Students

6. Nursing and Health Sciences – 63 (19.44%) Students

7. Undeclared/General Education – 20 (6.17%) Students

For the 2018-2019 school year, first-year student ethnicity in Group 2 at West Texas A&M University included 12 (3.70%) African Americans, 1 (0.31%) Asian, 86

(26.54%) Hispanics, 11 (3.40%) students of Multiple Races, 2 (0.62%) Native Americans, 4 (1.23%) students with Unknown Ethnicities, and 208 (64.20%) students were White. Of the students in Group 2, 114 (35.19%) students departed from the university while 210 (64.81%) students were retained after their first year at West Texas A&M University.

Group 3

In Group 3, 179 (55.25%) students were female and 145 (44.75%) were male. The average age was 18.17 years old. Students in Group 3 had 19 or more dual credit hours. Group 3 contained the following classifications of 221 (68.21%) Freshmen, 96 (29.63%) Sophomores, and 7 (2.16%) Juniors. There were 286 (88.27%) students that came from a Texas high school, whereas only 38 (11.73%) students came from an out-of-state high school. Individual college is reported below:

1. Agriculture and Natural Sciences – 99 (30.56%) Students

2. Business – 35 (10.80%) Students

3. Engineering, Computer Science and Mathematics – 46 (14.20%) Students

4. Education and Social Sciences – 20 (6.17%) Students

5. Fine Arts and Humanities – 47 (14.51%) Students

6. Nursing and Health Sciences – 60 (18.52%) Students

7. Undeclared/General Education – 17 (5.25%) Students

For the 2018-2019 school year, first-year student ethnicity in Group 3 at West Texas A&M University included 5 (1.54%) African Americans, 0 Asians, 81 (25.00%) Hispanics, 11 (3.40%) students of Multiple Races, 3 (0.93%) Native Americans, 1 (0.31%) student with Unknown Ethnicities, and 223 (68.83%) students were White. No

students in Group 3 departed from the university while 324 (100%) students were retained after their first year at West Texas A&M University.

The data was obtained through the Department of Institutional Research and Effectiveness, which is responsible for maintaining, analyzing, and reporting institutional data. The data requested includes hours of dual credit hours earned, first-year GPA, classification, ACT and SAT score, gender, age, ethnicity, college, high school graduation date, and whether or not the student departed from the university after their first year. Specifically, researchers were seeking information regarding factors that could be influenced by dual credit and impact student success. After excluding 71 students enrolled in a homeschool program, a college preparatory school, a foreign high school, had a missing high school date, or obtained college credit after graduating high school and enrolling at West Texas A&M University the qualitative data was transformed into quantitative data to be processed in SPSS. Any personally identifying information received in the data was scrubbed from the data set.

While all students in the 2018-2019 first-year cohort at West Texas A&M University were considered for the research, there was specific interest in dual credit students that had experience being concurrently enrolled in high school and college courses. Therefore, extra effort was made towards evaluating a large population of first-year students that qualify to gain a broader understanding regarding the characteristics of the population as a whole.

<div align="center">Instrumentation</div>

Using information and research from the aforementioned studies of dual credit, student motivation, and retention, a system was developed to evaluate the relationships in

the questions listed. Nominal data was transformed into qualitative data for comparison.

Dual credit hours are divided into three groups with 0 dual credit hours represented by

the number 1, 3-18 dual credit hours were represented with the number 2, 19 dual credit

hours or more were represented with the number 3, and 19 dual credit hours and more

were represented with a 4. This divide between the groups allowed researchers to

randomize a sample of students to compare trends and characteristics of the students

between groups and draw conclusions based on an equal number of groups. No students

earned 1-2 credit hours as the course hours awarded for one dual credit class were at least

3 credit hours. The six individual colleges were also transformed into quantitative data as

follows:

     Agriculture and Natural Sciences- 1

     Business- 2

     Engineering- 3

     Education and Social Sciences- 4

     Fine Arts and Humanities- 5

     Nursing and Health Sciences- 6

     General Studies- 7

     Student classification was transformed using the three classifications identified in

the data. Freshmen were represented by the number 1, sophomore classification was

represented by the number 2, and juniors were represented by the number 3. Based on

West Texas A&M University classification guidelines, students were classified based on

the number of credits earned that applied to their degree program. Freshmen are

considered students with 0-29 hours, Sophomores have 30-59 hours, and Juniors have 60-

89 college-level hours. No students classified as seniors were present in this study. Student retention was identified as 1 for yes the student was retained, and 2 for no. Students that were identified as participating in high school in Texas were transformed to 1 for in-state and 2 if they attended an out-of-state high school.

The remaining information concerning student success and the dependent variable of retention was collected via institutional data. Dual credit hours and retention were the independent variables in this study while the dependent variable measured was first-year student success.

<center>Data Collection</center>

The Institutional Review Board (IRB) at West Texas A&M University approved the collection of this data (Appendix A). Information regarding the students in this study was requested from the Department of Information Technology at West Texas A&M University (Appendix B). Approval for this research was sent to West Texas A&M University IRB on February 15, 2021 and approval was given on March 1, 2021. The fall 2018 - spring 2019 school year was selected as West Texas A&M University Information Technology does not have retained data needed for students before Spring 2019. The Department of Institutional Research and Effectiveness was able to retrieve data for the fall 2018 student cohort to evaluate students enrolled in a full collegiate school year not impacted by COVID-19) This gave researchers the opportunity to study the 2018-2019 first-year student cohort.

Per West Texas A&M University's admissions requirements, students must submit official transcripts from previous institutions including high school as well as colleges or universities the student may have attended. Students may submit high school

class rank with their ACT/SAT scores, or they may be admitted solely based on test scores. Admissions requirements for submitting class rank and ACT/SAT score are as follows:

1. Top 25% with no minimum ACT/SAT score

2. 26%-50% with 18 ACT or 960 SAT

3. 51%-75% with 21 ACT or 1060 SAT

4. 76%-100% with 23 ACT or 1130 SAT

If a student would like to submit only their test scores, a SAT score for Evidence-Based Reading and Writing must be 280 or higher and they must obtain a 530 or higher for Math. ACT scores require a minimum of 18 for English, 22 for reading, 22 for Mathematics, and 23 for Science. Students must also have a cumulative GPA of 2.0. This information along with student characteristics such as race, gender, and age are among the required information the university collects, retains, and compiles to gain a better understanding including but not limited to student characteristics, tracking of student advancement and achievements, and to provide information for institutional research such as what is found in this study.

Institutional data was requested in one batch from the university on March 3, 2021. This included dual credit hours earned, first-year GPA, classification, ACT and SAT score, gender, age, ethnicity, college at West Texas A&M University, high school graduation date, and whether or not the student departed from the university in the first year. Dual credit students were established based on the high school graduation date and when the students received college credit prior to enrolling at West Texas A&M University.

Data Analysis

The purpose of this study was to compare the perceived effect of dual credit hours on an individual's first-semester academic performance. In order to measure this, correlation and regression tests were run in the Statistical Package for Social Sciences (SPSS) Version 27. Microsoft Excel 2016 sought to organize data prior to utilizing SPSS. To gain a more descriptive overview of students' characteristics, Microsoft Excel 2016 was utilized in addition to SPSS. Descriptive measures used in SPSS were percentages, frequencies, means, standard deviations, and were applied to questions 2 and 4. These illustrated differences between and within dual credit groups and helped determine the impact of dual credit on the 2018-2019 first-year student cohort.

Data was retrieved from the Department of Institutional Research and Effectiveness and organized in Microsoft Excel 2016, providing inferential and descriptive statistics regarding students at West Texas A&M University for the purpose of benefiting the university and the public.

CHAPTER IV

RESULTS

Overview

The previous chapters discussed the history and context behind dual credit,
student success, motivation, and retention. Chapter I introduced the topic of dual credit
and its potential predictors of academic success that are crucial in understanding the
motives and implementation of dual credit. Chapter II discussed relevant research
regarding national, institutional, and individual insight on dual credit. Insight towards
dual credit, such as requirements and characteristics of dual credit students, was
provided, along with programs and policy research as related to dual credit research, in
the general population. Chapter III described the research design, population,
instrumentation, data collection, and statistical analysis. This chapter reports the findings
from the utilized instruments as well as research design in order to answer and explain
the purpose and questions of this study. Qualitative statistics are reported in research
question 4.

Purpose and Questions

The purpose of this study was to determine if there was an effective range of dual
credit hours that had the strongest association with student success in the first semester as
well as retention. Within the 2018-2019 first-year student cohort, there was also interest

in illustrating differences in college and the influence of dual credit on student success within the colleges. Specific research questions for this study included:

1. Is there a difference in first-year academic success when comparing students with dual credit to those without dual credit?

2. Do dual credit hours correlate with first-year GPA?

3. Is there a significant change in academic success depending on the number of dual credit hours a student took?

4. What are the characteristics of students retained at WTAMU compared to those who departed from the university?

<u>Student Characteristics</u>

This research utilized both quantitative and descriptive statistics in order to illustrate the results of the research questions. The following items were used to describe the target population of this study.

In Group 1, the average age of students at admittance to West Texas A&M University was $M = 18.21$ years old. Of the 324 students in Group 1, 166 (51.23%) were female, 158 (48.77%) were male. All 324 students in Group 1 were classified as freshmen. Although the number of students varies in terms of specific majors, there were 82 (25.31%) students in Agriculture and Natural Sciences, 34 (10.49%) Business students, 33 (10.19%) Engineering students, 43 (13.27%) Education and Social Sciences students, 50 (15.43%) Fine Arts and Humanities students, 55 (16.98%) Nursing and Health Sciences Students, and 27 (8.33%) General Studies students. While the recorded colleges were distributed based on student enrollment, Agriculture and Natural Sciences had the most students represented in the study while General Studies were the least

represented, (*n* of agriculture and natural sciences majors = 82, percent of agriculture and natural sciences majors = 25.31%, *n* of general studies = 27, percent of general studies = 8.33%, *n* of all other majors = 215, percent of all other majors = 66.36%).

Group 2 consisted of 324 students with an average age of *M* = 18.17 years old at the time of admittance. 179 (55.25%) of the 324 students were female, while 145 (44.75%) were male. All of the students in Group 2 were classified as freshmen as well. As separated by college, 89 (27.47%) students were in Agriculture and Natural Sciences, 33 (10.19%) students were in Business, Engineering had 34 (10.49%) students, 36 (11.11%) students were in Education and Social Sciences, Fine Arts and Humanities consisted of 49 (15.12%) students, and General Studies had 20 (6.17%) students. Agriculture had the most student representation, while General Studies had the least students represented (*n* of agriculture and natural sciences majors = 89, percent of agriculture and natural sciences majors = 27.47%, *n* of general studies = 20, percent of general studies = 6.17%, *n* of all other majors = 215, percent of all other majors = 66.35%).

The average age of students in Group 3 at the time of admittance was *M* = 18.13 years old. Of the 324 students, 199 (61.42%) were female and 125 (38.58%) were male. 221 (68.21%) students were classified as freshmen, 96 (29.63%) were classified as sophomores, and 7 (2.16%) students were classified as juniors. There were no students in any of the groups that were classified as seniors. Agriculture and Natural Sciences had 99 (30.56%) students, 35 (10.80%) students were in Business, 46 (14.19%) students were in Engineering, 20 (6.17%) students in Education and Social Sciences, 47 (14.51%) students in Fine Arts and Humanities, the Nursing and Health Sciences had 60 (18.52%) students,

and General Studies consisted of 17 (5.25%) students. The Agriculture had the largest

student representation, while General Studies has the smallest students represented (*n* of

agriculture and natural sciences majors = 99, percent of agriculture and natural sciences

majors = 30.56%, *n* of general studies= 17, percent of general studies = 5.25%, *n* of all

other majors = 208, percent of all other majors = 64.19%).

<div align="center">Findings Related to Research Question One</div>

Research Question 1: Is there a difference in first-year academic success when

comparing students with dual credit to those without dual credit?

The Whole Group

To determine Research Question 1, the academic success of the 2018-2019 first-

year student cohort, the researchers collected data regarding first-year GPA of the

students. GPA is measured on a 4.0 scale from 0.00 (letter grade of F, recognized as a

failing grade) to 4.00 (letter grade of A, recognized as an excellent grade). The results

indicated the average GPA of the first-year cohort was 2.79, with the most frequent GPA

being 4.0 (130 or 13.4% of students had a first-year GPA of 4.0). The reported standard

deviation of this average was 1.06. The lowest GPA reported was 0.00, the highest was a

4.0. Dual credit students reported a higher average GPA and lower standard deviation (*M*

= 2.79, *SD* = 1.06) than students without dual credit (*M* = 2.41, *SD* = 1.12). Comparisons

of first-year GPA between students with previous dual credit and those without are

displayed in Table 1.

Table 1 Cumulative First-Year GPA of Students with and Without Dual Credit

	M	SD	Min	Max	Dual Credit n = 603		No Dual Credit n = 324	
					M	SD	M	SD
First Year GPA	2.79	1.06	0	4.00	2.98	0.98	2.41	1.12

Note: n = 972. Grade Point Average Scale: 0.0 = F; 1.0 = D; 2.0 = C; 3.0 = B; 4.0 = A

Each college's first-year GPA average breakdown is reported as follows: the College of Agriculture and Natural Sciences had 270 students with an average GPA of 2.87, College of Business had 102 students with an average 2.73 GPA, College of Engineering had 113 students with an average GPA of 2.58, Education and Social Sciences had 99 students with an average GPA of 2.60, Fine Arts and Humanities had 146 students with a 2.88 GPA average, Nursing and Health Sciences had a total of 178 students with a 2.90 average GPA, and General Studies had 64 students and an average GPA of 2.75. Figure 8 displays the college breakdown of first-year students first-year GPA in the whole group consisting of 972 students.

*Figure 8 Cumulative Average First-Year GPA of First-Year Students*
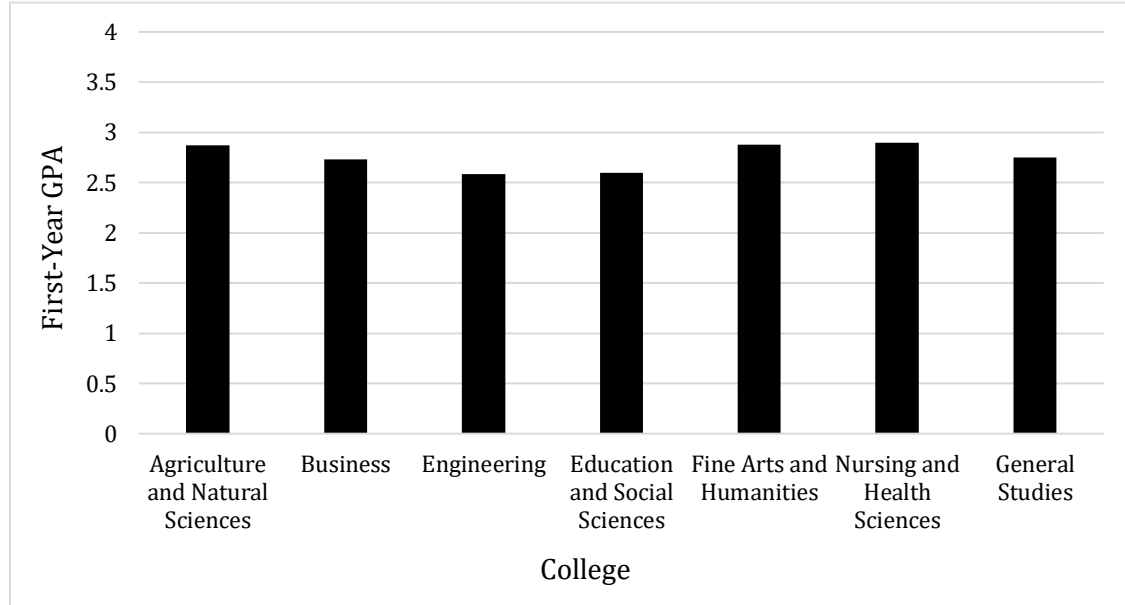
Note. n = 924.

Group 1 GPA

Students in Group 1 had no dual credit hours. The average GPA of Group 1 was 2.41 (*SD* = 1.06) and varies between colleges. 26 students received a 0.00 first-year GPA, which was the most frequent GPA received. 17 students achieved a 4.0 first-year GPA. Each college's breakdown is reported as follows: the College of Agriculture and Natural Sciences had 82 students with an average GPA of 2.37, College of Business had 34 students with an average 2.43 GPA, College of Engineering had 33 students with an average GPA of 2.26, Education and Social Sciences had 43 students with an average GPA of 2.20, Fine Arts and Humanities had 50 students with a 2.40 GPA average, Nursing and Health Sciences had a total of 55 students with a 2.63 average GPA, and General Studies had 27 students with an average GPA of 2.62. Comparisons between the college groups for students in Group 1 are displayed in Figure 9.

Figure 9 Average First-Year GPA of First-Year Students in Group 1 by College
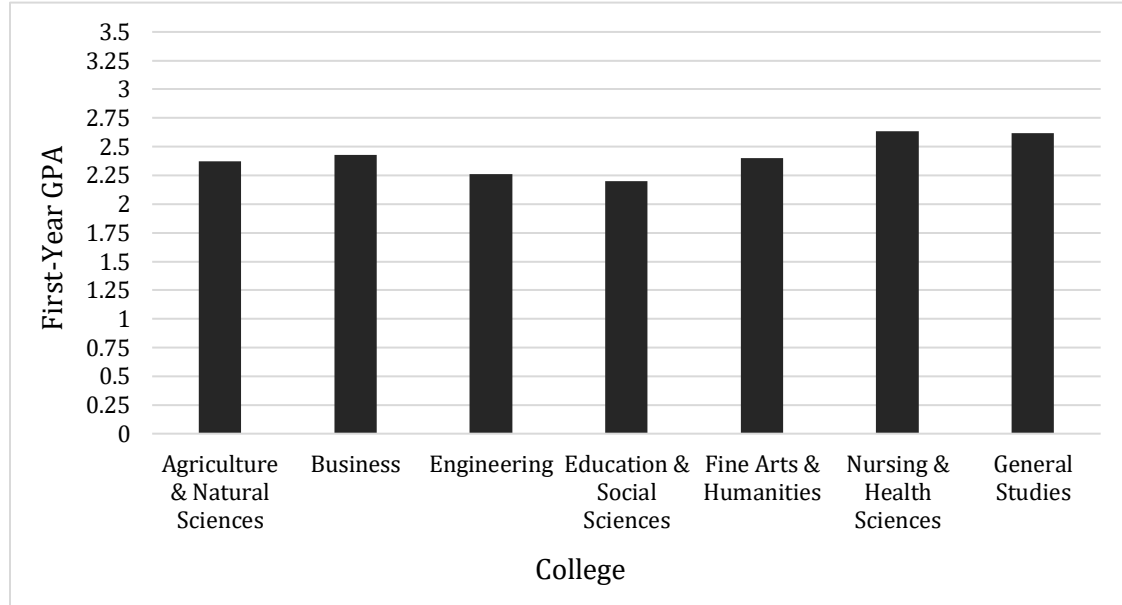
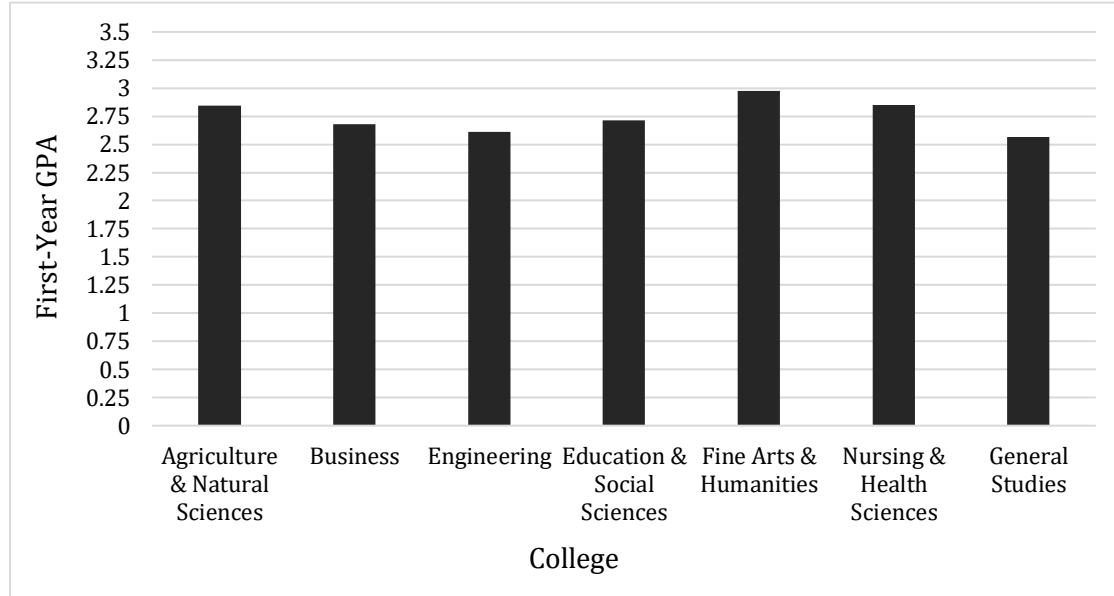
Note. n = 324. Students in Group 1 had no dual credit hours.

Group 2 GPA

Students in Group 2 had 3-18 dual credit hours. The total average GPA of group 2 was 2.79 (*SD* = 1.04). 12 students received a 0.00 GPA their first-year, while 41 students received a 4.0 GPA. A 4.0 was the most frequent first-year GPA received in Group 2. Each college's first-year student average GPA is as follows: the College of Agriculture and Natural Sciences had 89 students with an average GPA of 2.84, College of Business had 33 students with an average 2.68 GPA, College of Engineering had 34 students with an average GPA of 2.61, Education and Social Sciences had 36 students with an average GPA of 2.71, Fine Arts and Humanities had 49 students with a 2.98 GPA average, Nursing and Health Sciences had a total of 63 students with a 2.85 average GPA, and General Studies had 20 students with an average GPA of 2.56. Comparisons between the college groups for students in Group 2 are displayed in Figure 10.

Figure 10 Average First-Year GPA of First-Year Students in Group 2 by College

Notes. n = 324. Students in Group 2 had 3-18 dual credit hours.

Group 3 GPA

Students in Group 3 had 19 or more dual credit hours. The total average GPA of group 3 was 3.18 (*SD* = 0.89). Out of 324 students, 8 students received a 0.00 GPA their first-year while 72 students received a 4.0 GPA. A 4.0 was the most frequent first-year GPA received in Group 3. Each college's first-year student average GPA is as follows: the College of Agriculture and Natural Sciences had 99 students with an average GPA of 3.32, College of Business had 35 students with an average 3.08 GPA, College of Engineering had 46 students with an average GPA of 2.79, Education and Social Sciences had 20 students with an average GPA of 3.24, Fine Arts and Humanities had 47 students with a 3.28 GPA average, Nursing and Health Sciences had a total of 60 students with a 3.19 average GPA, and General Studies had 17 students with an average GPA of 3.19. Comparisons between the college groups for students in Group 3 are displayed in Figure 11.

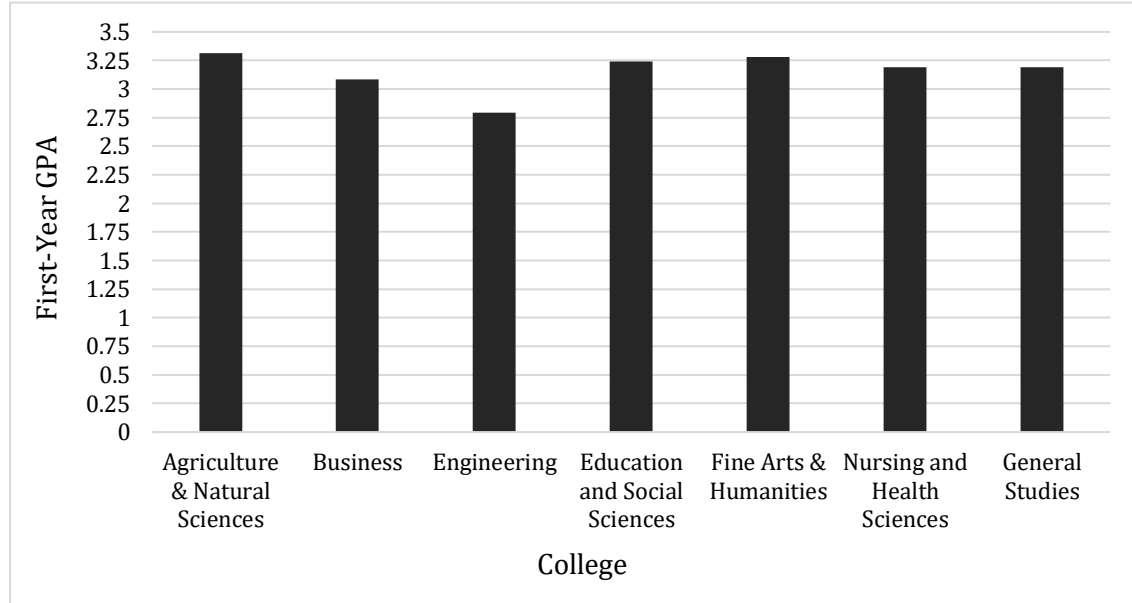*Figure 11 Average First-Year GPA of First-Year Students in Group 3 by College.*

Notes. n = 324 Students in Group 3 had 19 or more dual credit hours.

<u>Findings Related to Research Question Two</u>

Research Questions 2: Do dual credit hours correlate with first-year GPA?

The most frequent amount of credit hours taken were six dual credit hours while the highest amount of credit hours taken was 76 dual credit hours. The minimum amount of dual credit hours taken was three hours. 324 students had no dual credit hours, and 648 students had dual credit. 130 students received a 4.0 first-year GPA while 46 students received a 0.00 GPA their first year. Students with a 0.00 first-year GPA had an average of 7.57 dual credit hours while students with a 4.0 first-year GPA had an average of 21.26 dual credit hours. Researchers utilized a Pearson Correlation and determined that there was a correlation between dual credit hours and first-year GPA. Through Pearson's Correlation, it was found there was significance at 0.01 level, with a reported $r = 0.29$. While a correlation was present, it was a weak correlation (Davis, 1971). With $n = 972$,

the sample size is large enough that the test is able to recognize effects, even if they are weak. Although the correlation is weak, researchers wanted to determine what relationships were present and the significance of those relationships.

To gain better insight of the relationship between dual credit hours and first-year GPA, researchers collected information regarding students with a 0.00 GPA and students with a 4.0 GPA to determine the relationship with dual credit. Of the 972 students in the study, 130 had a 4.0 GPA. The highest number of dual credit hours taken in the 4.0 category was 60 dual credit hours, of which only 1 student had. Seventeen students took the lowest number of dual credit hours of 0. The average dual credit hours taken for students with a 4.0 was 21.26 dual credit hours. Forty-six students received a 0.00 first-year GPA and of those students, 26 had no dual credit hours. One student had a total of 57 dual credit hours (the highest amount of dual credit hours in this group) in the 0.00 GPA group. The average dual credit hours for students with a 0.00 GPA was 7.57 dual credit hours.

<u>Findings Related to Research Question Three</u>

Research Questions 3: Is there a significant change in academic success depending on the number of dual credit hours a student took?

To determine the effect of dual credit hours on first year GPA, researchers started with a parametric test by utilizing a linear regression in SPSS (2017). While there was a statistical significance found on the $p < 0.01$ level, the R Square value (0.046) was too low for the significance to determine a strong relationship between first-year GPA and dual credit hours. Due to this weak relationship, researchers utilized a nonparametric test to determine how much of an effect dual credit had on first-year GPA by performing a

quadratic regression in SPSS (2017). The quadratic regression did find a statistical significance at the $p < 0.01$ level, and the R Square value (0.062) was higher than that found in the linear regression analysis (linear regression R Square value = 0.046 while the R Square value for the quadratic analysis = 0.062 with a difference of 0.016). The relationships established through the linear and quadratic are displayed in Figure 12. While the R Square value for the quadratic regression was higher than the linear regression, the relationship between dual credit and first-year GPA was determined as weak as determined by Davis (1971) interpretations of classification.

An occurrence that was noted by researchers was the small group of students that had 50 or more dual credit hours. This group consisted of 18 with 17 students coming from a high school in Texas while one came from an out of state high school. This small group of students had a 3.01 first-year GPA. Only 2 students in this group received a 4.0 GPA and one student received a 1.0 GPA, but all students were retained. Seven of the students were female and 11 were male with an average age of 18. The youngest student in this group was 17 and the oldest student was 19. Students in this group had the classifications of freshmen (two students), sophomore (nine students), and junior (seven students) This occurrence was noted by researchers because once the students passed 60 credit hours, none had received a 4.0 first-year GPA.

Figure 12 Linear and Quadratic Relationship of Dual Credit and First-Year GPA
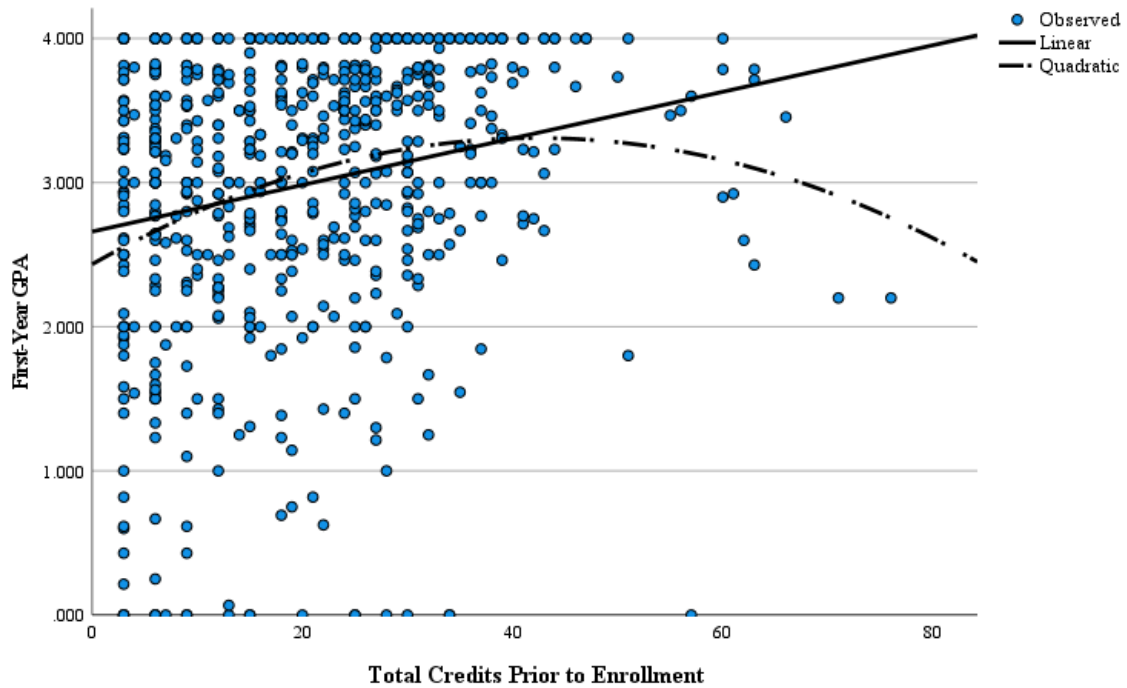
Research Question 4: What are the characteristics of students retained at WTAMU compared to those who departed from the university?

Retention was determined by whether or not students remained at West Texas A&M University after their first year after the 12th class day when enrollment is verified. Retention was indicated with a yes or no.

The Whole Group

The results indicated that 711 (73.15%) of students were retained while 261 (26.85%) students departed from West Texas A&M University. Of the students retained, 85 (11.96%) were from out-of-state high schools, while 626 (88.04%) students were from high schools in Texas. Of students that were not retained, 42 (16.09%) students were from high schools out of state while 219 (83.91%) students were from high schools in the

state of Texas. The average first-year GPA of students retained was a 3.10, compared to those who departed which had a first-year GPA average of 1.95. Students who were retained had an average of 16.90 dual credit hours, and those who departed from the university had an average of 3.70 dual credit hours. Students who were classified as Sophomores and Juniors were all retained, and 261 students classified as Freshmen departed while 607 were retained.

Females were more likely to be retained, with 422 staying after their first year while 289 males were retained. Alternatively, 122 females and 139 males departed from the university. Of the 57 African American first-year students, 32 were retained while 25 departed from the university. Three Asian students had been retained, and 1 had departed. Of the 279 Hispanic first-year students, 201 had been retained and 78 departed from the university. Of students that were Multiple Races, 27 students were retained and 13 departed. 3 Native Americans were retained while 2 departed. Of the 13 students with Unknown Ethnicities, 6 were retained and 7 had departed. Of the 547 White students, 439 were retained and 135 had departed.

Breakdown of first-year students who were retained and departed by college are listed as follows:

1. Agriculture and Natural Sciences - 205 (75.93%) retained, 65 (24.07%) departed
2. Business - 71 (69.61%) retained, 31 (30.39%) departed
3. Engineering - 81 (71.86%) retained, 32 (28.32%) departed
4. Education and Social Sciences - 66 (66.67%) retained, 33 (33.33%) departed
5. Fine Arts and Humanities - 115 (78.77%) retained, 31 (21.23%) departed
6. Nursing and Health Sciences - 129 (72.47%) retained, 49 (27.53%) departed

7. General Studies - 44 (68.75%) retained, 20 (31.25%) departed

Group 1

Of the 324 students in Group 1, 177 (54.63%) of students were retained while 147 (45.37%) students departed from West Texas A&M University. Of the students retained, 21 (46.67%) were from out-of-state high schools, while 156 (55.91%) students were from high schools in Texas. In students that were not retained, 24 (53.33%) students were from high schools out of state while 123 (44.09%) students were from high schools in the state of Texas. The average first-year GPA of students retained was a 2.90, compared to those who departed which had a first-year GPA average of 1.82. Students in Group 1 had no dual credit hours and were all classified as Freshmen. Of those classified as Freshmen, Group 1 had the most Freshmen students depart with a total of 147 (56.32%) of the 261 Freshmen departed from West Texas A&M University.

Of the 324 students retained in Group 1, 92 females stayed after their first year while 85 males that were retained. Alternatively, 74 females and 73 males departed from the university. In the 40 African American students in Group 1, 19 were retained while 21 departed from the university. Two Asian students had been retained, and one had departed. Of the 112 Hispanic first-year students, 67 had been retained and 45 departed from the university. Nine students of Multiple Races were retained and 9 departed. Of the 8 students with Unknown Ethnicities, 4 were retained and 4 had departed. Of the 143 White students, 76 were retained and 67 had departed. There were no Native Americans present in Group 1. First-year GPA in retained and departed students in Group 1 by their college is displayed in figure 13.

Breakdown of first-year students who were retained and departed by college are listed as follows:

1. Agriculture and Natural Sciences - 42 (51.22%) retained, 40 (48.78%) departed

2. Business - 18 (52.94%) retained, 16 (47.06%) departed

3. Engineering - 15 (45.45%) retained, 18 (54.55%) departed

4. Education and Social Sciences - 24 (55.81%) retained, 19 (44.19%) departed

5. Fine Arts and Humanities - 32 (64.00%) retained, 18 (36.00%) departed

6. Nursing and Health Sciences - 32 (58.18%) retained, 23 (41.82%) departed

7. General Studies - 14 (51.85%) retained, 13 (48.15%) departed

Figure 13 Average First-Year GPA in Retained and Departed Students by College in Group 1
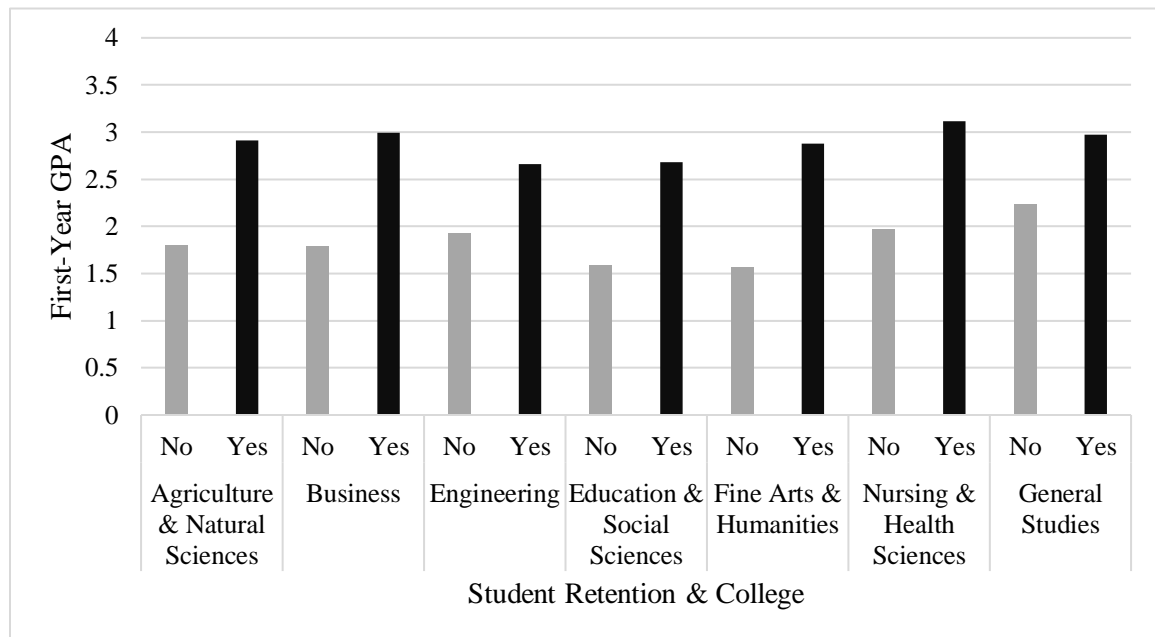
Group 2

In Group 2, 210 (35.19%) of students were retained while 114 (64.81%) students departed from West Texas A&M University. Of the students retained, 26 (8.02%) were

from out-of-state high schools, while 184 (56.79%) students were from high schools in Texas. Of students that were not retained, 18 (5.56%) students were from high schools out of state while 96 (29.63%) students were from high schools in the state of Texas. The average first-year GPA of students retained was a 3.16, compared to those who departed which had a first-year GPA average of 2.11. Students in Group 2 had 3-18 dual credit hours and were all classified as Freshmen. Of those classified as Freshmen, Group 2 had a total of 114 (56.32%) students of the 261 Freshmen departed from West Texas A&M University.

In Group 2, 131 females stayed after their first year while 79 males were retained. Alternatively, 48 females and 79 males departed from the university. Of the 12 African American students in Group 2, eight were retained while four departed from the university. There was 1 Asian student present in Group 2 who had been retained. Of the 86 Hispanic first-year students, 53 had been retained and 33 departed from the university. 7 students of Multiple Races were retained and 4 departed. The 2 Native American students in Group 2 departed from the university. Of the 4 students with Unknown Ethnicities, 1 was retained and 3 had departed. Of the 208 White students, 140 were retained and 68 had departed. First-year GPA in retained and departed students in Group 2 by their college is displayed in figure 14.

Breakdown of first-year students who were retained and departed by college are listed as follows:

1. Agriculture and Natural Sciences - 64 (71.91%) retained, 25 (28.09%) departed
2. Business - 18 (54.55%) retained, 15 (45.45%) departed
3. Engineering - 20 (58.82%) retained, 14 (41.18%) departed

4. Education and Social Sciences - 22 (61.11%) retained, 14 (38.89%) departed

5. Fine Arts and Humanities - 36 (73.47%) retained, 13 (26.53%) departed

6. Nursing and Health Sciences - 37 (58.73%) retained, 26 (41.27%) departed

7. General Studies - 13 (65.00%) retained, 7 (35.00%) departed

Figure 14 Average First-Year GPA in Retained and Departed Students by College in

Group 2
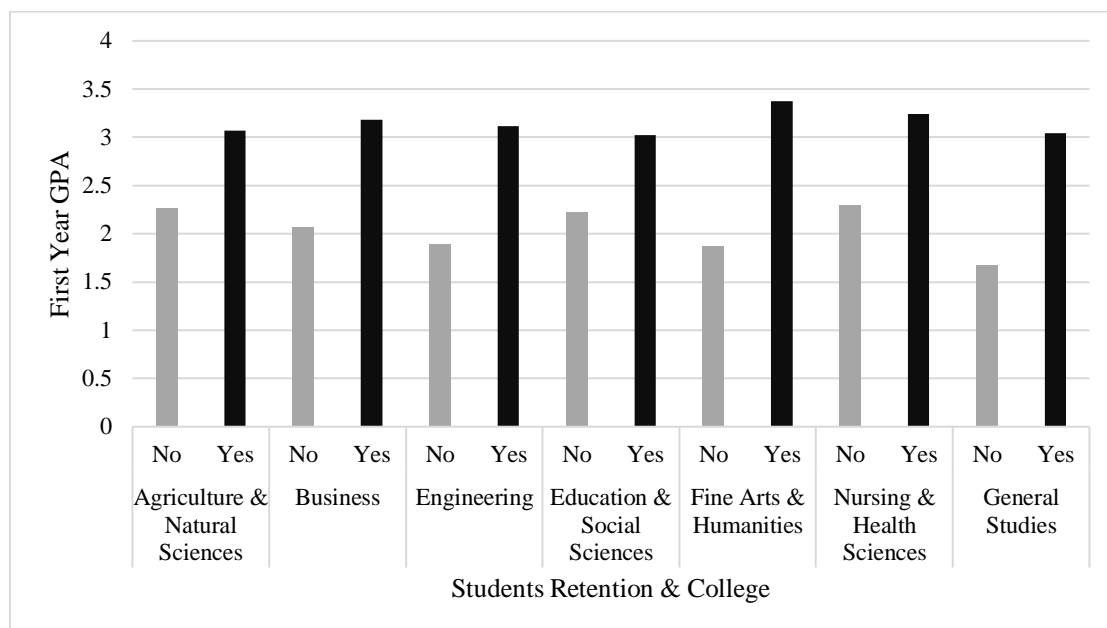
Group 3

Group 3 was unique in the fact that 100% of the students were retained. All 324 students in Group 3 stayed at West Texas A&M University after their first year. Of these students, 38 (11.73%) were from out-of-state high schools, while 286 (88.27%) students were from high schools in Texas. The average first-year GPA of students retained was a 3.18. Students in Group 3 had 19 or more dual credit hours and consisted of 221 Freshmen, 96 Sophomores, and seven Juniors. The Freshmen group had a first-year GPA of 3.15, the Sophomores had a 3.25, and the Juniors had first-year GPA of 3.06.

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In Group 3, 199 females stayed after their first year while 125 males that were retained. There were 5 African Americans, 81 Hispanics, 11 students of Multiple Races, 3 Native Americans, one student of Unknown Ethnicity, and 223 White students. There were no students with a reported ethnicity of Asian in Group 3. First-year GPA in retained students in Group 3 by their college is displayed in figure 14.

Breakdown of first-year students who were retained by college are listed as follows:

1. Agriculture and Natural Sciences - 99 retained

2. Business - 35 retained

3. Engineering - 46 retained

4. Education and Social Sciences - 20 retained

5. Fine Arts and Humanities - 47 retained

6. Nursing and Health Sciences - 60 retained

7. General Studies - 17 retained

Figure 15 Average First-Year GPA in Retained and Departed Students by College in

Group 3
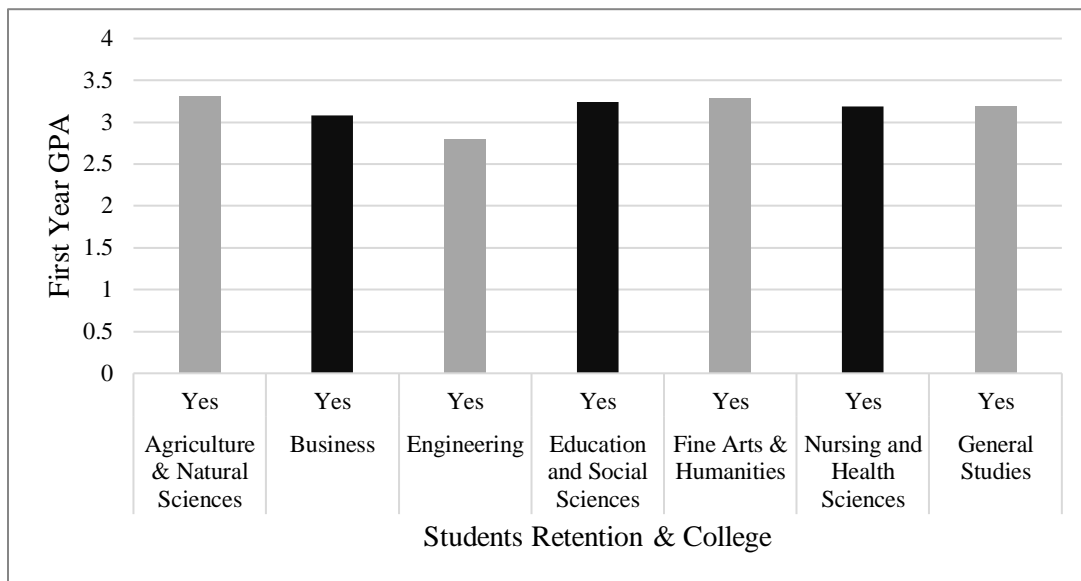
CHAPTER V

RECOMMENDATIONS AND CONCLUSIONS

Summary

The previous chapters developed the context of dual credit, retention, and student success as well as the methodology and findings from the utilized instruments as a part of the study on dual credit students. Chapter I introduced the topic of dual credit and potential predictors of academic success in order to better understand the implementation and factors of dual credit. Chapter II discussed relevant research regarding this individual, institutional, and national insight on dual credit as well as factors of student success. Insight towards dual credit, such as requirements and characteristics of dual credit students, was provided, along with programs and policy research as related to dual credit research, in the general population. Chapter III described the research design, population, instrumentation, data collection, and statistical analysis. Chapter IV reports the findings from the utilized instruments as well as research design in order to answer and explain the purpose and questions of this study. Descriptive and correlational findings regarding 2018-2019 first-year students in regards to first year GPA and retention. This chapter discusses findings and makes recommendations for future research.

A growing number of students are enrolling in dual credit courses in the state of Texas, with an increase of 753% from 2000 to 2017 (Texas Higher Education Board, 2018). Through initiatives such as the 60x30TX plan, the number of dual credit students is expected to continue to rise (Texas Higher Education Board, 2018). At West Texas A&M University, 71% of first-year students in the 2018-2019 cohort had dual credit hours. Dual credit is of importance to not only West Texas A&M University, but also to the students enrolled in dual credit courses and the individuals promoting enrollment. To address the need in understanding how dual credit impacts student success and retention, this study focuses on how dual credit hours are related to student success in an attempt to determine a range of dual credit hours at which students are the most successful based on first-year GPA. This study utilized qualitative research to describe student population as well as factors of retainment, while Pearson's correlation coefficient and quadratic regressions were used to determine if dual credit is related to academic success and retention between the fall of 2018 and spring 2019 semesters. Understanding the cognitive and non-cognitive characteristics of incoming students can help the university and colleges within the university better understand dual credit students and the need for resources to help with student academic success and retention.

<u>Purpose and Questions</u>

The purpose of this study was to determine an optimal number of dual credit hours by measuring academic success and retention in first-year students. In the 2018-2019 cohort, special interest was taken into consideration regarding individual colleges and how dual credit students were performing depending on student college. Specific research questions developed for this study included:

1) Is there a difference in first-year academic success when comparing students with dual credit to those without dual credit?

2) Do dual credit hours correlate with first-year GPA?

3) Is there a significant change in academic success depending on the number of dual credit hours a student took?

4) What are the demographic characteristics of students retained at WTAMU compared to those who departed from the university?

Population

The information provided in this research determined the population for this study as the 2018-2019 first-year student cohort at West Texas A&M University. The researchers attempted to capture an accurate representation of the student population through the requested institutional data. In order to generalize the results, students were sorted based on dual credit hours into three separate groups. The groups were broken down as 1 = no dual credit hours, 2 = 3-18 dual credit hours, and 3 = 19 or more dual credit hours. For the population of students with dual credit hours, 18 was the median number of dual credit hours taken. This provided a natural break in the dual credit hours at 324 students per group. The students within each group were then assigned randomized numbers to determine which students would be included in the survey. A majority of the students were White ($n = 574$) and in the College of Agriculture and Natural Sciences ($n = 270$).

Discussion and Conclusions

Conclusions from Research Question 1

This question sought to determine how well students with dual credit perform academically compared to those without dual credit in the 2018-2019 first-year students. To illustrate academic success of the 2018-2019 first-year students at West Texas A&M University, first-year GPA was compiled and evaluated regarding the students as a whole group, then compared students in Group 1, Group 2, and Group 3 based on the average first-year GPA of the groups. The average first-year GPA of the whole group indicated the 2018 - 2019 first-year student cohort sat below the national public institution GPA average of a 3.0 (Rojstaczer & Healy, 2010) by having an average first-year GPA of 2.79 ($SD = 1.06$). Group 1, with no dual credit, had a GPA lower than the whole group and national average with a 2.41 ($SD = 1.12$) first-year GPA. Group 2, with 3 - 18 hours of dual credit, had a higher GPA than Group 1 with a first-year GPA of 2.79 ($SD = 1.04$) which is reflective of the whole group's first-year GPA. Group 3, with 19 or more dual credit hours, had the highest first-year GPA of all the groups and was above the national average with a 3.18 ($SD = 0.89$) first-year GPA. This would indicate that the group with 19 or more dual credit hours performed at a higher academic level than those with less dual credit hours.

The differences in first-year GPA could be a result of students with more dual credit hours being more exposed to college courses and able to perform at a higher academic level than those with lower dual credit hours. If students are spending less time adjusting to rigorous college coursework, more focus can be applied towards variables that improve academic success such as student involvement and study practices. Another factor that could influence the academic success of students would be their classification

in their first year. Quality and integrity of dual credit courses compared to college courses has been a concern (Andrews, 2000). In groups 1 and 2 of this study, 100% of students were classified as freshmen and would be advised for courses based on their classification. However, Group 3 had 68.21% of students classified as Freshmen, 29.63% classified as Sophomores, and 2.16% classified as Juniors. Placement of students in courses based on classification can have a significant impact on first-year GPA. It also raises questions of how their dual credit hours are applied at the institutional level and if the hours are significantly impacting student classification. Application of dual credit hours may have a long-term effect on academic success as well as retention depending on students' perception of how their dual credit would apply.

Conclusions from Research Question 2

The second research question sought to identify the correlation that exists between dual credit and first-year GPA. Pearson's correlation coefficient was used to measure the potential effect that dual credit might have on first year GPA and define the strength of the relationship in this study. There was a statistically significant relationship between dual credit and first-year GPA. The Pearson's correlation coefficient established a statistical significance at the $p < .01$ level with a reported $r = 0.29$. While this does imply that there is a statistical significance between dual credit and first-year GPA, the strength of the relationship was weak (Davis, 1971). This could be due to the large number of students included in the study ($n = 972$). Although there was a weak relationship, researchers decided to explore this relationship further to determine where the relationship between dual credit and first-year GPA was occurring given the literature

that found significance between dual credit and academic success (Troutman, 2018; Puyear et al., 2001; Peng, 2003; Young Jr. et al., 2013).

In this study, the 130 students with a 4.0 had an average of 21.26 dual credit hours. The lowest GPA in this group was 0.00 with 46 students in this group. The highest number of dual credit hours was 60 with 1 student having a 4.0 first-year GPA and 60 dual credit hours. 17 students in the 4.0 category had 0 dual credit hours. Alternatively, the 46 students with a 0.00 first-year GPA had an average of 7.57 dual credit hours. The highest number of dual credit hours for students with a 0.00 GPA was 57 credit hours, which 1 student had. 26 of the students with a 0.00 GPA had 0 hours. If we compare the student with a 4.0 first-year GPA and 60 dual credit hours to the student with a 0.00 first-year GPA and 57 dual credit hours, it would make the case that the number of dual credit hours a student takes would not have an effect on first-year GPA. These two students had a difference of 3 dual credit hours, and yet their first-year GPA varied significantly.

Conclusions from Research Question 3

Research question 3 sought to determine how much of a change was present in the relationship between dual credit and academic success. Since a weak relationship was established using a linear regression, researchers utilized a quadratic regression and found that while the quadratic regression determined a higher R Square value, the relationship between dual credit hours and first-year GPA was still weak (Davis, 1971). While this group is small, there was an expectation that with more dual credit hours, students would be more prepared for college courses and able to achieve higher GPA's. This led researchers to believe that though there is a correlation in first-year GPA and dual credit, the significance comes from the large number of students in the study. If students have a

recorded first-year GPA and dual credit hours, there will be some significance found, but that does not necessarily mean that dual credit is directly related to first-year academic success for West Texas A&M University students. Figure 12 in Chapter 4 provided visuals of the relationship between dual credit hours and first-year GPA, which allowed researchers to identify any trends or phenomena for question 3. While there was not a consistent linear relationship of dual credit hours and first-year GPA, there was a large cluster of students between the 20 and 35 credit hours mark that received a 3.0 or higher. This cluster of students may indicate an optimal range of dual credit hours that correlates with higher first-year GPA. Other than the 20 to 35 credit hour phenomenon, first-year GPA scores were too far spread out for a significant trend to be established between first-year GPA and dual credit.

Conclusions from Research Question 4

Research question 4 sought to determine the characteristics of students retained after their first year at West Texas A&M University compared to those who did not based on information provided when looking at students with dual credit and those without. Students that were retained after their first year had an average of 16.90 dual credit hours and a first-year GPA of 3.10. Those who departed from the university had an average of 3.70 dual credit hours and a first-year GPA average of 1.95. The more dual credit hours a student had, the more likely they were to be retained. For instance, 54.63% of students with no dual credit hours were retained whereas 64.81% of students with 3-18 credits were retained and 100% of students with 19 or more credit hours were retained. While dual credit has been applauded for exposing students to the rigorous college environment (Tobolowsky & Allen, 2016; Bailey et al., 2002), this research suggested that students

enrolled in dual credit were more likely to be retained. This could be in part of being

exposed to college courses early on and building the self-confidence needed (Lotowski et

al., 2016) to stay at West Texas A&M University after their first year. By obtaining

enough dual credit hours to get ahead, but not enough to overwhelm the student with

courses above their academic level their first year, students may find it easier to establish

a higher social involvement important for retention (Lotowski et al., 2004) if they have

already developed necessary skills such as time management and study skills (Krumrei-

Mancuso et al., 2013) from taking dual credit courses.

<div align="center">Implications</div>

Understanding the factors that might influence first-year academic success is

critical to implementing resources and supports to ensure student retention.

Understanding the impact of dual credit hours on first-year GPA and retention could help

the University and the colleges within to detect students with a higher chance of

departing from the university or their selected major if they are unable to succeed within

their first year.

In spite of existing literature citing dual credit impacts student success

(Troutman, 2018; Puyear et al., 2001; Peng, 2003; Young Jr. et al., 2013), research results

in this study found that while dual credit does have a statistically significant impact on

first-year GPA, the significance is very low (Daivs, 1971). Researchers specifically

utilized first-year GPA as the measure for student success to ensure results would not be

skewed based on students "culture-shock" and adjustment that takes place in the first

semester. First-year academic success can be impacted by a multitude of factors,

including self-efficacy that may already occur in students that elect to take dual credit

courses (Han et al., 2017; Klopfenstein & Lively, 2012). For this reason, dual credit would not be a strong indicator of student success, rather the extrinsic or intrinsic motivation of students would stand as a strong indicator of student success and retention.

The variable of student success is confirmed in the study conducted by Han et al. (2017) which found self-efficacy was highly associated with academic performance and retention. When students believed in their ability to be academically successful, their self-efficacy also increased (Han et al, 2017). Studies such as Han et. al. (2017) and Klopfenstein & Lively's (2012) allow researchers to better understand the relationship between motivated students and their likelihood to take dual credit while the student motivation continues to be a factor for student success at college.

The researchers had anticipated dual credit might be significantly related to first-year GPA partially due to the large number of students included in the survey. While researchers did randomly select a smaller sample of the population, the sample size was fairly large. This impacted the Pearson's correlation coefficient run to determine the relationship between dual credit hours and first year GPA. With a sample size of $n = 972$, there existed a small significance at the $p < .01$ level. While statistically significant, the relationship between the two was weak (Davis, 1971). However, there is value in determining and understanding if different amounts of dual credit hours impact this relationship, and if so to what degree. The weak relationship determined in this study may change if there were a diverse group of school years to pull student information from.

Tobolowsky & Allen (2016) asserted students with dual credit are more likely to receive a higher first-year GPA than those who did not take dual credit. This study

confirmed this when Groups 2 and 3 had a higher average first-year GPA than students in Group 1. While these groups display an increase of first-year GPA, the correlation and quadratic regression utilized in this study did not find a strong relationship between the two. However, there was a definite increase in the student's likelihood to be retained after their first year as dual credit hours increased. This phenomenon could indicate the more dual credit hours students take, the more likely they are to feel the need to continue on to the next year.

Despite the relationship between dual credit and academic success, an interesting phenomenon was observed regarding a group of dual credit students that were not originally separated in the main research of this study. Researchers noticed a trend that once students surpassed the 60-credit hour threshold, no students had received a 4.0 GPA their first-year. While this population of students was small ($n = 8$), five of the students did not receive a first-year GPA above a 3.0. While this did not directly affect the impact of dual credit on first-year GPA, it was an interesting occurrence given that existing literature claims the importance of exposure from dual credit courses (Tobolowsky & Allen, 2016; Bailey et al., 2002).

<u>Recommendations</u>

It should be noted the results of this study were primarily descriptive in nature and utilized correlation as well as regression to determine relationships between variables. Any application or generalization of the findings and assertions in this study should be applied with caution as it encompasses students at West Texas A&M University. The following are recommendations for such applications of the research, as well as for continued research over the topic of academic success and retention at West Texas A&M

University. In order to more accurately determine the potential effect that variables such as dual credit have on first-year student success, GPA should be determined through the examination from semester to semester. This would also allow for a closer look into how students are adapting to their college courses in relation to dual credit experience.

Due to the limited information available on students at West Texas A&M University, further research should encompass a more robust sample of students. This research evaluated the Fall 2018 - Spring 2019 school year, but there would be a significant benefit in expanding the school years examined to better encompass student success and dual credit hours across more student cohorts. Applying the research over multiple years would allow for more accurate and detailed research of the impact of dual credit on student success. While West Texas A&M University did not save cohorts before the Spring of 2019 needed for this study, individual departments may have retained data that could be collected and utilized in replication of this study and other institutions might have kept cohort information further back than that provided in this study.

Research of continued retention and GPA of student cohorts past their first year would greatly enhance the long-term effects of dual credit hours. Dual credit aims to ensure students are prepared enough for college that they are not only successful and retained in their first year, but in the continuation of their college careers as well.

Demographics such as ethnicity and where or how dual credit was taken should be looked at more closely in relation to student success and retention. Location or how dual credit was received could be a significant factor of student success when the student transitions to college. While the researchers did not run tests to confirm the relationship between variables such as ethnicity and location of taking dual credit, there may be more

influence on the first-year GPA due to the variables rather than whether or not dual credit hours have an impact on student success.

Closer inspection of student retainment in their first selected major is an important factor of how dual credit impacts student success and retention. If students came into a major where the course work was above their current educational level, the student could be selected to change their major or college entirely. Researching this type of information can be largely beneficial for universities and colleges within the universities in helping with implementing better placement of dual credit students to ensure retention and academic success.

While the average age of first-year students was 18.17, the youngest student was 17 and the oldest was 22. Previous studies have researched the implications of students' maturity based on the perceptions of their professors. Future research would benefit from understanding how students view their own preparedness for college courses based on their perceived maturity as well as the perceived maturity from their instructors. Studying the factor of maturity can help researchers determine the optimal range of dual credit hours through a better understanding of when students should be taking coursework based on how their maturity develops with courses taken.

Support and interventions for both dual credit students and students without dual credit should be implemented and utilized to improve student success and retention. While students with dual credit hours are more likely to be retained than those without, there's still over a quarter of students with 3-18 dual credit hours that are not retained. Further research into why this specific group of dual credit students was not retained and the implications that have on future dual credit students could help West Texas A&M

University implement supports and interventions depending on what resources are needing to be met.

While a small population of students had over 50 credit hours, research regarding the performance of this group would be beneficial in understanding exactly how higher hours of dual credit impact first-year GPA. Consideration for understanding why students choose to take a high number of dual credit hours would help universities and other institutions in the recruitment and retention of students. Researching how these students are performing in their classes by surveying students and instructors while compiling data on academic success, retainment, as well as other factors of student success and characteristics would be beneficial in developing resources and information regarding dual credit students.

REFERENCES

Akos, P. & Kretchmar, J. (2017). Investigating grit at a non-cognitive predictor of college

    success. *The Review of Higher Education* 40(2), 163-186. John Hopkins

    University Press.

Allen, D., & Dadgar, M. (2012). Does dual enrollment increase students' success in

    college? Evidence from a quasi-experimental analysis of dual enrollment in New

    York City. *New Directions for Higher Education*, (158) 11–19.

    https://doi.org/10.1002/he.20010

Amarillo College (n.d.). Dual Credit. Amarillo College. Retrieved from

    https://www.actx.edu/dualcredit/index.php

Amarillo College (n.d.). Dual credit process. Amarillo College. Retrieved from

    https://www.actx.edu/dualcredit/index.php

An, Brian P. (2015). The role of academic motivation and engagement on the relationship

    between dual enrollment and academic performance." *The Journal of Higher*

    Education (Columbus), vol. 86(1), 98–126.

Andrews, H. (2000). The dual-credit explosion in Illinois community colleges.

    Community College Journal, 71(3), 12.

Astin, A. W. (1984). Student involvement: A developmental theory for higher education.

    Journal of College Student Personnel, 25(4), 297-308.

Bailey, T., Hughes, K., & Karp, M. (2002). What role can dual enrollment programs play

      in easing the transition between high school and postsecondary education?

      (ED465 ed., pp. 1-22, Rep. No. ED-99-00-0160). New York, NY: Columbia

Bucci, K. L. M. (2020). The high school side of the dual enrollment partnership:

      Perspectives and critical factors. *ProQuest Dissertations Publishing*.

Carlson, R.H., & McChesney, C.S. (2014). Income sustainability through educational

      attainment. *Journal of Education and Training Studies*, 3(1).

      https://doi.org/10.11114/jets.v3i1.508

Dare, L., & Nowicki, E. (2015). Conceptualizing concurrent enrollment. *The gifted child*

      quarterly, 59(4), 249–264. https://doi.org/10.1177/0016986215597749

Dare, A., Dare, L., & Nowicki, E. (2017). Concurrent enrollment: comparing how

      educators and students categorize students' motivations. *Social Psychology of*

      Education, 20(1), 195–213. https://doi.org/10.1007/s11218-016-9364-8

Davis, J. A. (1971). Elementary survey analysis. Englewood Cliffs, NJ: Prentice–Hall.

Day, M. C., Kelley, H. M., Browne, B. L., & Kohn, S. J. (2020). Assessing motivation

      and learning strategy usage by dually enrolled students. *Smart Learning*

      Environments, 7(1) http://dx.doi.org/10.1186/s40561-020-00131-w

Fink, J., Jenkins, D., & Yanagiura, T. (2017). What happens to students who take

      community college "dual enrollment" course in high school? *Community College*

      Research Center https://ccrc.tc.columbia.edu/media/k2/attachments/what-

      happenscommunity-college-dual-enrollment-students.pdf

Garcia, H. A., Eicke, D., McNaughtan, J., & Harwood, Y.. (2019). Understanding dual

      credit programs: Perspectives from faculty, staff, and administrators. *Community*

College Journal of Research and Practice, 44(8), 584–594.

https://doi.org/10.1080/10668926.2019.1626301

Han, C., Farruggia, S.P., & Moss, T.P. (2017). Effects of academic mindsets on college

students' achievement and retention. *Journal of College Student Development*

58(8), 1119-1134. doi:10.1353/csd.2017.0089.

Hughes, K. L., Rodriguez, O., Edwards, L., & Belfield, C. (2012a). Broadening the

benefits of dual enrollment. *Community College Research Center*.

https://ccrc.tc.columbia.edu/publications/broadening-benefits-dual-

enrollment.html

Hughes, K.L., & Edwards, L. (2012b). Teaching and learning in the dual enrollment

classroom. *New Directions for Higher Education*, *2012*(158), 29–37.

https://doi.org/10.1002/he.20012

Hughes, T.E. (2016). The impact of high school dual enrollment participation on

bachelor's degree attainment and time and cost to degree. *ProQuest Dissertations*

Publishing.

Johnson, J. L. (2019). Engagement, academic achievement, and grit as components of

college freshman success. West Texas A&M University, retrieved from

https://hdl.handle.net/11310/231

Jones, S.J. (2014). Student participation in dual enrollment and college success.

Community College Journal of Research and Practice, 38(1), 24–37.

https://doi.org/10.1080/10668926.2010.532449

Kanny, M.A. (2015). Dual enrollment participation from the student perspective. *New Directions for Community Colleges, 2015*, 59-70, retrieved from https://doi.org/10.1002/cc.20133

Karp, M. M., Calcagno, J. C., Hughes, K. L., Jeong, D. W., & Bailey, T. R. (2007). The postsecondary achievement of participants in dual Enrollment: An analysis of student outcomes in two states. Community College Research Center, Columbia University

Kim, J., Kirby, C., & Bragg, D. D. (2006). Dual credit: Then and now (In Brief). Champaign, IL: Office of Community College Research and Leadership. Retrieved from https://files.eric.ed.gov/fulltext/ED495242.pdf

Klopfenstein, K., & Lively, K. (2012). Dual enrollment in the broader context of college-level high school programs. New Directions for Higher Education, 2012(158), 59–68. https://doi.org/10.1002/he.20015

Krumrei-Mancuso, E.J., Newton, F.B., Kim, E., & Wilcox, D. (2013). Psychosocial factors predicting first-year college student success. Journal of College Student Development 54(3), 247-266. doi:10.1353/csd.2013.0034.

Kuh, G.D., Cruce, T.M., Shoup, R., Kinzie, J., & Gonyea, R.M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. The Journal of Higher Education (Columbus), 79(5), 540–563. https://doi.org/10.1353/jhe.0.0019

Lotkowski, V.A., Robbins, S.B., & Noeth, R.J. (2004) The role of academic and non-academic factors in improving college retention. ACT Policy Report. Retrieved from https://files.eric.ed.gov/fulltext/ED485476.pdf

Miller, T., Kosiewicz, H., Tanenbaum, C., Atchison, D., Knight, D., Ratway, B., Delhommer, S., Levin, J. (2018) Dual-credit education programs in Texas: Phase II. American Institute for Research. Retrieved from https://www.air.org/project/dual-credit-education-programs-texas

National Center for Education Statistics. (2018). West Texas A&M University: Retention and graduation rates (Rep. No. 229814). Retrieved from National Center for Education Statistics website.

National Center for Education Statistics. (2021). Annual earnings by educational attainment. Retrieved July 9, 2021, from https://nces.ed.gov/programs/coe/indicator/cba

Nelson, S. (2014). Dual Credit and Academic Rigor Discussed. Texas Community College Teachers Association. Retrieved from tccta.org/2014/10/16/dual-credit-and-academic-rigor-discussed/

Peng, Z. (2003). A comparison of grade point averages and retention rates of dual enrollment students and non-dual enrollment students in public four-year universities in the state of Texas. ProQuest Information and Learning Company.

Puyear, D., Thor, L., & Mills, K. (2001). Concurrent enrollment in Arizona: Encouraging success in high school. New Directions for Community Colleges, 2001(113), 33. https://doi.org/10.1002/cc.6

Rigsby, T. (2019). A comparative study of student success outcomes of early college high school and dual credit at a central Texas community college. ProQuest Dissertations Publishing.

Rojstaczer, S., & Healy, C. (2010) Grading in American colleges and universities.

      Teachers college Record. Retrieved from

      https://www.gradeinflation.com/tcr2010grading.pdf

Shapiro, D., Dundar, A., Huie, F., Wakhungu, P.K., Bhimdiwala, A. & Wilson, S. E.

      (2018, December). Completing college: A national view of student completion

      rates – fall 2012 cohort (Signature Report No. 16). National Student

      Clearinghouse Research Center.

Society of Human Resources Management. (2015). SHRM survey findings: The hiring of

      2015 college graduates. Retrieved from https://www.shrm.org/hr-today/trends-

      and-forecasting/research-and-surveys/pages/shrm-hiring-college-

      graduates2015.aspx

Stewart, C., Wall, A., & Marciniec, S. (2016). Mixed signals: Do college graduates have

      the soft skills that employers want? Competition Forum, 14(2), 276-281.

      Retrieved from https://www.researchgate.net/publication/316066488

Texas Association of School Boards Community College Services (2018) Evolution of

      dual credit. Retrieved from https://www.tasb.org/services/community-college-

      services/documents/evolution-of-dual-credit.pdf

Texas Education Agency. (2020). Dual credit frequently asked questions. Texas

      Education Agency. Retrieved from

      https://tea.texas.gov/sites/default/files/Dual%20Credit%20FAQ%20TEA%204.28

      .2020.pdf

Texas Education Agency. (n.d.). Dual credit. Texas Education Agency | Dual Credit.

      https://tea.texas.gov/academics/college-career-and-military-prep/dual-credit

Texas Higher Education Coordinating Board. (2012). Dual Credit Report. Retrieved from

http://www.thecb.state.tx.us/DocID/PDF/2452.PDF

Texas Higher Education Coordinating Board. (2015a). 60x30TX. Retrieved from

http://www.thecb.state.tx.us/reports/PDF/6584.PDF

Texas Higher Education Coordinating Board. (2015b). Closing the gaps by 2015.

Retrieved from http://www.thecb.state.tx.us/reports/PDF/0379.PDF

Texas Higher Education Coordinating Board (2015c). Texas higher education strategic

plan 2015-2030: 60x30TX. Retrieved from http://www.60x30tx.com/

Texas Higher Education Coordinating Board (2016a) Closing the gaps final progress

report. Retrieved from http://www.thecb.state.tx.us/reports/PDF/9052.PDF

Texas Higher Education Coordinating Board (2016b) Overview of dual credit. Retrieved

from http://www.thecb.state.tx.us/reports/PDF/9052.PDF

Texas Higher Education Coordinating Board. (2018). Overview: Dual credit. THECB.

Retrieved from https://www.highered.texas.gov/institutional-resources-

programs/public-universities-health-related-institutions/transfer-resources/dual-

credit-initiatives/

Texas Higher Education Coordinating Board. (2021) Dual credit and total enrollments,

Fall semesters. Dual Credit Data. Retrieved from

http://www.txhighereddata.org/index.cfm?objectId=AEE9A640-D971-11E8-

BB650050560100A9

Tobolowsky, B. F., & Allen, T. O. (2016). On the fast track: Understanding the

opportunities and challenges of dual credit. ASHE Higher Education Report,

42(3), 7-106.

Troutman, D.R., Hendrix-Solo, A., Creusere, M., & Mayer, E. (2018) Dual credit and
success in college. The University of Texas Dual Credit Study. The University of
Texas System. Retrieved from https://www.utsystem.edu/documents/docs/ut-
system-reports/2018/dual-credit-and-success-college

What is the PSAT? - About the PSAT test. (2019). Kaplan Test Prep. Retrieved from
https://www.kaptest.com/psat/what-is-the-psat

Webber, K.L. -, Krylow, Rebecca Bauer, & Zhang, Qin. (2013). Does involvement really
matter? Indicators of college student success and satisfaction. Journal of College
Student Development, 54(6), 591–611. https://doi.org/10.1353/csd.2013.0090

West Texas A&M University. (n.d.a) Marketable skills. West Texas A&M University –
Retrieved from https://www.wtamu.edu/student-support/career-services/prof-
dev/Marketable%20Skills.html

West Texas A&M University. (n.d.b) Pre-University programs. West Texas A&M
University – Retrieved from https://www.wtamu.edu/admissions/pre-university-
program/index.html

West Texas A&M University. (n.d.c). Procedures and policies. West Texas A&M
University - Acalog ACMS™. Retrieved from
https://catalog.wtamu.edu/content.php?catoid=22&navoid=1834

Young, R.D, Joyner, S.A., & Slate, J.R. (2013). Grade point average differences between
dual and nondual credit college students. *Urban Studies Research*, *2013*, 1–6.
https://doi.org/10.1155/2013/638417

Zeidenberg, M., & Bailey, M. (2010) Human resource development and career and
technical education in American community colleges. Community College

Research Center, Columbia University. Retrieved from

https://ccrc.tc.columbia.edu/publications/human-resource-development-cte.html

APPENDIX A

Institutional Research Board Approval Letter

WT Academic Research
Environmental Health and Safety
WEST TEXAS A&M UNIVERSITY.

INSTITUTIONAL REVIEW BOARD FOR HUMAN SUBJECTS
Letter of Approval

March 1, 2021

Dr. Robertson:

The West Texas A & M University Institutional Review Board is pleased to inform you that upon review, proposal **#2021.02.021** for your study titled, **"Dual Credit Enrollment: Finding a Balance,"** meets the requirements of the WTAMU Standard Operating Procedure (SOP) No. 15.99.05.W1.01AR Institutional Review Board (Human Subject Research). Approval is granted for one calendar year. This approval expires on **February 28, 2022**.

Principal investigators assume the following responsibilities:

1. **Continuing Review:** The protocol must be renewed on or before the expiration date if the research project requires more than one year for completion. A Continuing Review form along with required documents must be submitted on or before the stated deadline. Failure to do so will result in study termination and/or loss of funding.
2. **Completion Report:** At the conclusion of the research project (including data analysis and final written papers), a Close out form must be submitted to AR-EHS.
3. **Unanticipated Problems and Adverse Events:** Pursuant to SOP No. 15.99.05.W1.13AR, unanticipated problems and serious adverse events must be reported to AR-EHS.
4. **Reports of Potential Non-Compliance:** Pursuant to SOP No. 15.99.05.W1.05AR, potential non-compliance, including deviations from the protocol and violations, must be reported to the IRB office immediately.
5. **Amendments:** Changes to the protocol must be requested by submitting an Amendment form to AR-EHS for review by the IRB. The Amendment must be approved by the IRB before being implemented. Amendments do not extend time granted on the initial approval
6. **Consent Forms:** When using a consent form, only the IRB approved form is allowed.
7. **Audit:** Any proposal may be subject to audit by the IRB Administrator during the life of the study. Investigators are responsible for maintaining complete and accurate records for five years and making them available for inspection upon request.
8. **Recruitment**: All recruitment materials must be approved by the IRB. Recruitment materials distributed to potential participants must use the approved text and include the study's IRB number, approval date, and expiration dates in the following format: WTAMU IRB##-##-## Approved: ##/##/#### Expiration Date: ##/##/####.
9. **FERPA and PPRA:** Investigators conducting research with students must have appropriate approvals from the Family Education Rights and Privacy Act (FERPA)

administrator at the institution where the research will be conducted in accordance with the Family Education Rights and Privacy Act (FERPA) if applicable to the research being proposed. The Protection of Pupil Rights Amendment (PPRA) protects the rights of parents in students ensuring that written parental consent is required for participation in surveys, analysis, or evaluation that ask questions falling into categories of protected information.

Sixty days prior to the expiration of this proposal, you will receive a notification of the approaching expiration date at which time you will need to submit an Amendment/Continuation/Close out form.

Thank you for your cooperation with the IRB and we wish you well with your research project.

Sincerely,

Dr. Gary Bigham
Chair, WTAMU IRB

Dr. Angela Spaulding
Vice President of Research and Compliance

APPENDIX B

Department of Institutional Research and Effectiveness Cohort Selection

From: DePue, Brooke <bdepue@wtamu.edu>
Sent: Friday, March 5, 2021 11:14:42 AM
To: Davis, Tallee L. <tldavis@wtamu.edu>
Subject: RE: Data Collection for Thesis: Dual Credit Enrollment: Finding a Balance

Good Morning Tallee,

Sorry for the delayed response. This request has come with some controversy due to FERPA violations and the amount of work behind it all. After much discussion with The Registrar's Office, Strategic Relations, IT and within the IR office, we have run into some road blocks but, have come up with some options for you:

Option 1:

- We are waiting for you to get approval from IT to view student level data so you will not be violating FERPA by having access to the data you requested. While it was approved through IRB, IRB does not look at FERPA requirements and since this research is asking for student ID and specific FERPA information we have to make sure you get clearance to release anything to you. (currently waiting to hear back on this, request was made yesterday)
- Once you get clearance I will be able to send you over a raw data file, it will require some cleaning and work on your part but I am happy to help you along, we can set an appointment sometime next week.
- This is the part that might make option 1, undesirable to you. IT no longer has saved cohorts past Spring 2019. I was able to manipulate and get you Fall 2018. This leaves you with only one year of data that you requested. We could go forward to the 2019-2020 year if you would like but, please consider how this data will possibly affected by COVID and if you would want to add that into your thesis as a limitation. Also this is a much smaller data set then you were originally requesting.

Option 2:

- Going a survey route. I can provide you a list of students who have been enrolled at WT during the years you requested and you can make a survey asking them if they participated in dual credit prior to coming to WT, and then related questions on demographics and even their perceptions if dual credit was worth it.
- This option still has a quantitative aspect to it but also you could add qualitative if you want. And you have the possibility to have a much larger sample size.

I know this is a lot to soak in. Please feel free to give me a call 806.651.3453 and we can talk over any questions you may have or different options you want to explore. Thanks for your patience on this. We shall get you to your defense! Don't lose hope.

Brooke DePue, PhD
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Institutional Research and Effectiveness
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