

A QUANTITATIVE ASSESSMENT OF TEXAS HOUSE BILL 505: COLLEGE DUAL
CREDIT COURSES AND ACADEMIC SUCCESS AMONG HIGH SCHOOL STUDENTS

A Dissertation

by

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This dissertation meets the standards for scope and quality of
Texas A & M University-Corpus Christi and is hereby approved.

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Abstract

Texas House Bill 505 expanded dual credit programs to include high school freshmen and sophomores. This study examined the relationship of high school student characteristics and academic success in first attempt dual credit courses. Characteristics refer to year in high school, gender, and high school size. Success is passing scores in English, mathematics, and history. Data were collected from a community college, providing services to area high schools. Of 826 cases 10 were freshmen and sophomores. More data from the state was unavailable as the state does not require reporting. Therefore, analyses included juniors and seniors with chi-square and logistic regression. House Bill 505 was assessed with Fowler's (2013) Six-Stage Model of public policy. Results from statistical analyses were mixed, indicating context plays a large role and it is not known how well House Bill 505 functions. Future research should focus on tracking high school students in dual credit courses.

Dedication

I dedicate this dissertation to my family who have made me who I am today. To my mother who passed from this world almost 11 years ago, but taught me at a very young age that I can do anything I put my mind to. Turns out, she was right! To my father who passed away unexpectedly just three short months ago, he believed in me no matter what and was my biggest supporter and cheerleader along this journey.

To Meghan and Staci, thank you for joining the “girl team” in our family. You two are extraordinary, intelligent girls who have bright futures ahead of you. Thank you for loving my boys and making them happy.

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CHAPTER I:
INTRODUCTION

Background and Setting

The opportunity to earn college credit while in high school is an attractive option for Texas high school students wishing to gain a jumpstart on a college career. Earning college credits while a student is in high school is referred to as dual credit courses. While dual credit initially began as a local educational option close to 50 years ago, it has evolved into a major educational component for high schools nationwide (Kim, Kirby, & Bragg, 2004). Participation rates in dual credit courses in Texas experienced a 545% increase from Fall 1999 to Fall 2007 (THECB, 2008). Dual credit is a national program, allowing qualifying high school students to take college-level courses and receive both high school and college credit at the same time. This provides students with the opportunity to start their college career while still in high school. While dual credit programs are in place at community colleges and universities nationwide, colleges and universities are regulated by governing boards for the state in which they are located. Institutions of higher education in Texas are governed by The Higher Education Coordinating Board (THECB). In the Texas K-12 educational system, governed by the Texas Education Agency (TEA), school districts are mandated to provide students opportunities to earn college credit prior to graduation from high school (Giani, Alexander, & Reyes, 2014).

The Texas Legislature passed House Bill 505 (2015), which significantly reduced the required minimum high school grade level to enroll in dual credit courses in Texas (See Appendix A). The previous statute required students to be entering the 11th or 12th grade prior to dual credit eligibility. Beginning with the fall 2015 semester, students entering high school as freshmen and sophomores (9th & 10th grades) are eligible to take dual credit courses. All other admissions requirements for dual credit enrollment remained the same. All students in Texas,

including dual credit students, are required to be assessed and prove their college-readiness. It is important to note dual credit students are not eligible to take developmental coursework in college. The framework of developmental coursework is such that it is designed to cover high school level material in order to prepare the student for the college level coursework (Radford, Pearson, Ho, Chambers, Ferlazzo, & MPR Associates, 2012).

The state of Texas requires all students enrolling in dual credit courses to be evaluated by an approved assessment. A student must reach a certain score in the areas of reading, writing, and mathematics. Students are limited to three approved assessments that can be used for college readiness assessment. These include the American College Testing (ACT), the Scholastic Aptitude Test (SAT), and the Texas Success Initiative (TSI) assessment. The TSI assessment is a widely used assessment for admission into a Texas community college. Community colleges and Texas public high schools can administer the TSI test on their own campus at times that align with local campus schedules. The ACT and SAT assessments are administered nationally and are limited in frequency. According to Burdman (2012), the use of placement exams to determine college readiness is not necessarily a true indicator of college readiness or a relevant predictor of future college success. In addition, Giani, Alexander, and Reyes (2014) pointed to a lack of significant studies, which take into account numerous policy changes enacted by state legislature as evidence to support the argument of dual credit not providing the success and opportunities for which the program was originally designed.

Research by Chagas and Fernandae (2011) suggested that age, which can be correlated to year in high school, as well as gender and school size, are significant factors in the success of students, both in high school and college. In an effort to increase the number of college students in Texas, the Texas Legislature essentially continues to push the age of first time college-going

students to a lower age. It remains to be seen if this will impact first time dual credit students' academic success. Shulruf, Wang, Zhao, and Baker (2011) conducted a study which examined college success factors including, among others, gender, age, and high school grade point average in a first-year undergraduate program. The study found older female students with excellent high school grade point averages were more likely to be successful in their first year of the undergraduate program than their younger male counterparts. However, Giani, Alexander, and Reyes (2014) pointed to a lack of significant studies, which take into account numerous policy changes enacted by state legislators as evidence to support the argument of dual credit not providing the success and opportunities for which the program was originally designed.

Age effect, as it relates to the success of students enrolled in first time college coursework, can be a critical factor. Typical first time college freshmen attending college immediately after high school graduation are 18 or 19 years of age. A high school freshman is typically 14 years of age upon entering high school and a high school sophomore is 15 years of age. While it is easy to locate research supporting age effect in college settings, it also seems possible that there is an optimum age for first time college student success. According to Chagas and Fernandaes (2011), higher education institutions struggle to find ways to retain students who stop or drop out of college after an unsuccessful first semester, especially if students are under the age of 21 years. The commitment either to succeed in college or even return after a poor semester is not as strong for younger students as for students who are older and have a stronger sense of personal responsibility in their school trajectory. Amro, Mundy, and Kupczynski (2015) found evidence supporting the theory that age plays a significant factor in first time college student success, particularly in face-to-face classroom settings.

Gender can also be a predictive indicator for student success in first-time college students. Jones, Mendenhall, and Myers (2016) found that males, both in traditional coursework and nontraditional coursework, identified themselves as having more stress while attending college than did their female counterparts. The reason for this is not clear, as the study only examined their perceived stress level. A recent study suggested the impact of gender is so great and impactful that there should be a different standard for measuring student success for males and females in college courses (Rabito, Hoffman, & Person, 2015). This is primarily attributed to the perceived stress level male students feel, whether from outside pressures or self-imposed pressures, to be successful in multiple areas such as education, work, and family. As these are typically stressors experienced by either traditional college age students, it is possible that gender may not be a useful predictor for dual credit students who may be as young as 14 or 15 years old and not experiencing work or family pressures.

Smaller high schools, also a predictive factor, historically offer smaller class sizes, lower student/teacher ratios, and typically experience higher success rates. These benefits are so impactful, the Texas Higher Education Coordinating Board (THECB) mandated the formation and support of early college high schools in Texas, which by design, focus on these factors as promoting success and encourages the progression towards an associate degree while attending high school (Chapa, Galvan-De Leon, Solis, & Mundy, 2014). The success of these early college high schools is dependent on the small school size, as it provides students with ample opportunities to interact with instructors. This same model, which advocates for smaller class size and lower student/teacher ratios, should also be applicable to the downward expansion of dual credit to high school freshmen and sophomores. The larger the high school, it would seem the higher the risk of students being unsuccessful in their first time dual credit course experience.

As states continue to legislate college eligibility for younger and younger students, it raises concern for a dual credit student's ability to succeed in a college or university classroom setting, especially when a student is enrolled in a larger Texas high school.

Statement of the Problem

The downward expansion of dual credit coursework to include high school freshmen and sophomores poses many questions and possible obstacles. While Texas colleges are mandated by House Bill 505 (2015) to provide dual credit coursework to these younger students, public Texas high schools have the flexibility to decide which dual credit course offerings will be provided to students. Public high schools also have the flexibility to decide whether they allow high school freshmen and sophomores to participate in dual credit course offerings (Texas Administrative Code 19, Chapter 74, Subchapter C, Section 25). Often, high schools offer very basic core coursework for dual credit such as English, history, and college algebra. As students and parents begin to understand the benefits of dual credit and its impact on a student's grade point average (GPA) and consequently on scholarship opportunities, their demand for additional course inventory in dual credit curriculum increases too (An, 2013). These requests are being met with resistance for many reasons. The ultimate decision for allowing a high school student to enroll in a dual credit course lies with the local district. The district controls the courses offered to its high school students each semester as well as who is eligible to take dual credit courses. Texas high schools also have a long history of providing opportunities to earn college credit with Advanced Placement (AP) coursework, which is an exam-based program (Kim et al., 2004). Mansell and Justice (2014) pointed to AP coursework, culture and atmosphere, and personal hindrances as top reasons for both student's and school's reasons for choosing traditional high school classroom settings over dual credit.

However, there is limited evidence to support college level success for high school freshmen and sophomores. For districts across the state that allow their students to participate in dual credit courses as freshmen and sophomores, the impact of this decision could possibly result in a negative effect as students continue to progress through their high school careers (Tobolowsky & Allen, 2016). If the course proves to be too difficult for students and produces unsuccessful results, the required high school credit for graduation could be in jeopardy. Low grades in dual credit courses can result in low college GPAs before ever graduating from high school. This low cumulative GPA can prevent high school seniors from being accepted and attending the university of their choosing after high school graduation. The impact of college coursework obtained while in high school can play an important role and possibly have a negative effect on future college plans for students.

The push for students to enroll in college courses at a lower age could potentially have the opposite affect than hoped for by Texas legislators. The call by the Texas Higher Education Coordinating Board (2016) for increased student enrollment in postsecondary educational institutions by the Closing the Gaps initiative fell short of the original goal. The most recent Texas education plan established by the Texas Higher Education Coordination Board (2015), targeting postsecondary enrollment goals is the 60x30TX Plan. This new strategic plan picks up where Closing the Gaps left off with the primary goal of at least 60% of Texans will have completed a postsecondary certificate or degree by the year 2030. As Closing the Gaps experienced a large increase in college enrollment through the dual credit program, the 60x30TX initiative specifically targets the dual credit program as a resource to increase college enrollment. As 60x30TX became effective, legislators supported the initiative with the passage of House Bill 505. In hopes of gaining an even larger dual credit population, House Bill 505 lifted previous

restrictions by allowing high school freshmen and sophomores to enroll in dual credit courses and removing all restrictions limiting the number of credit hours a dual credit student can take while in high school. While there is evidence that supports student in 11th and 12th grades, typically ages 16 and 17, do well in dual credit courses, there is no such evidence to support the inclusion of students in 9th and 10th grades, typically ages 14 and 15, to enroll in dual credit coursework. Time and research will be major determining indicators if this legislative mandate proves to be positive or negative for Texas students.

Theoretical Framework

The study was guided by Alexander Astin's Theory of Student Involvement (1993), which is an umbrella theory covering many critical elements including student persistence throughout the student's pursuit of degree attainment. Astin's theory asserts that academic outcomes are a critical factor in student success and persistence. Astin defined student persistence as a student-centered holistic approach to measure student success based on a wide array of student outcomes.

The conceptual framework for Astin's theory includes three elements: inputs; environments; and outcomes. Inputs refer to the characteristics of the student at the time of entry into college. Input measures can include courses taken in high school, choice of career, reasons for attending college, religious preference, parental occupation, parental income, parental education level, race, ethnicity, age, gender, and marital status. Environmental measures can include institutional characteristics, student peer group characteristics, socioeconomic status, academic preparation, faculty characteristics, curriculum, major of study, place of residence, and student involvement. Outcome measures are characteristics, knowledge, attitudes, beliefs, and values that exist after a student has graduated. Outcome measures are classified as either

Psychological or Behavioral and categorized as Affective or Cognitive (Astin, 1993). For example, academic achievement is classified as Psychological and Cognitive.

Astin's theory of involvement has five basic assumptions about student involvement: (a) Involvement requires an investment of psychosocial and physical energy; (b) Involvement is continuous, and the amount of energy invested varies from student to student; (c) Aspects of involvement may be qualitative and quantitative; (d) What a student gains from being involved is directly proportional to the extent to which they were involved; and (e) Academic performance is correlated with student involvement (Astin, 1993).

Academic achievement plays a significant role in student persistence and has a positively related impact in areas such as retention, graduating with honors, achieving higher standardized test scores, and increases in cognitive skills. Astin (1993) asserted that an increase in overall academic development provides students with significant measures of satisfaction and confidence, which in turn has a positive correlation on students' commitments to reach educational goals.

Student retention, widely used by institutions to track student matriculation, measures only one outcome; students returning to school for subsequent semesters (McMahon, 2015). Many community colleges and universities define student retention as the measure of students who are on track to graduate in the identified designated timeframe for a particular postsecondary degree or certificate (Astin, 1993). In contrast, student persistence takes multiple measures into account, many of which are driven by academic performance, including hours spent studying, interaction with peers in educational environments such as study groups or tutoring sessions, and participating in college internships (Astin, 1993). A study conducted by McGrath and Braunstein (1997) supported Astin's assertion of the importance of grades and

found the first semester grade point average was the single most significant predictor of student retention and attrition. As institutions begin to understand the benefit of measuring student persistence instead of retention while taking into account the impact of academic performance, the focus shifts from students graduating within a specific timeframe to students graduating within their own realistic timeframe.

The legislative change in dual credit will create a scenario in which a student's first college semester could be completed at the age of 14 or 15 years old while attending a local high school. According to Astin's Theory of Student Persistence, this semester will prove crucial to the academic future of these students through their college persistence.

Purpose of the Study

The purpose of the study was to examine how student characteristics relate to academic success in a first attempt in a dual credit environment. There are two major variables for the study. First, student characteristics is the independent variable. It refers to year in high school (freshman, sophomore, junior, or senior), gender, and high school size. The second is the dependent variable, academic success. Academic success is passing scores in English, mathematics, and history dual credit courses.

The following research questions guide the study:

1. To what extent does the student characteristic of year in high school relate to success in passing a dual credit course on students' first attempt?
 - 1.1 To what extent does year in high school relate to success in passing a dual credit English course on students' first attempt?
 - 1.2 To what extent does year in high school relate to success in passing a dual credit History course on students' first attempt?

- 1.3 To what extent does year in high school relate to success in passing a dual credit mathematics course on students' first attempt?
2. To what extent does the student characteristic of gender relate to success in passing a dual credit course on students' first attempt?
 - 2.1 To what extent does gender relate to success in passing a dual credit English course on students' first attempt?
 - 2.2 To what extent does gender relate to success in passing a dual credit history course on students' first attempt?
 - 2.3 To what extent does gender relate to success in passing a dual credit mathematics course on students' first attempt?
3. To what extent does the student characteristic of high school size relate to success in passing a dual credit course on students' first attempt?
 - 3.1 To what extent does high school size relate to success in passing a dual credit English course on students' first attempt?
 - 3.2 To what extent does high school size relate to success in passing a dual credit history course on students' first attempt?
 - 3.3 To what extent does high school size relate to success in passing a dual credit mathematics course on students' first attempt?
4. Are student characteristics proportionate to grades among dual credit students first attempt in an English course according to student characteristics?
 - 4.1 Is year in high school proportionate to grades among dual credit students first attempt in an English course according to year in high school?

- 4.2 Is gender proportionate to grades among dual credit students first attempt in an English course according to school size?
- 4.3 Is school size proportionate to grades among dual credit students first attempt in an English course according to student gender?
5. Are student characteristics proportionate to grades among dual credit students first attempt in a mathematics course according to student characteristics?
- 5.1 Is year in high school proportionate to grades among dual credit students first attempt in a mathematics course according to year in high school?
- 5.2 Is gender proportionate to grades among dual credit students first attempt in a mathematics course according to school size?
- 5.3 Is school size proportionate to grades among dual credit students first attempt in a mathematics course according to student gender?
6. Are student characteristics proportionate to grades among dual credit students first attempt in a history course according to student characteristics?
- 6.1 Is year in high school proportionate to grades among dual credit students first attempt in a history course according to year in high school?
- 6.2 Is gender proportionate to grades among dual credit students first attempt in a history course according to school size?
- 6.3 Is school size proportionate to grades among dual credit students first attempt in a history course according to student gender?

Definition of Terms

For the purpose of the study, the following definition of terms are provided.

General Terms

College-ready is a determination by assessment which determines a student's eligibility to enter credit, college level coursework (Gewertz, 2015).

Developmental coursework are courses designed to teach remedial reading, writing, or mathematics in order to prepare students for college level reading, writing, or math (Davis, 1999).

Dual credit courses are courses taken at the college level in which the student earns credit in both college and high school (Tobolowsky & Allen, 2016).

First attempt means the first time a student has enrolled in any dual credit course (Giani, Alexander, and Reyes, 2014).

Gateway course is defined as a core course that is necessary for students to complete in order to progress through their chosen major (Archer & Miller, 2011).

National Student Clearinghouse is an agency responsible for the collection of data for institutes of higher learning (Dynarski, Hemelt, & Hyman, 2015).

Persistence is defined as a student-centered holistic approach to measure student educational success based on a wide array of student outcomes (Astin, 1993).

Retention is defined as an institution-centered measure of student educational success based solely on degree or certificate attainment within the designated timeframe for a degree or certificate (Astin, 1993).

Texas Education Agency (TEA) is the governing body for public school districts in the state of Texas (Barnes & Slate, 2014).

Texas Higher Education Coordinating Board (THECB) is the governing body for higher education institutions in the state of Texas (Davies, 2011).

Texas Success Initiative (TSI) is a mandate enacted in 2003 by the Texas Higher Education Coordinating Board which requires all college students in the state of Texas to be assessed for college readiness in the areas of reading, writing, and mathematics. Students deemed not college-ready are required to take remedial, or developmental, coursework in order to become college-ready prior to taking college level coursework (Fuller, Kearley, Byerly, & Ramin, 2014).

Independent Variables

Year in high school was determined as freshman, sophomore, junior, or senior. A freshman is a student who has entered high school and has 0 to 7 number of high school credits as determined by official school records. Typically, freshmen are 14 years of age. A sophomore is a student who is enrolled in high school and has 8 to 14 number of high school credits as determined by official school records. Typically, sophomores are 15 years of age. A junior is a student who is enrolled in high school and has 15 to 20 number of high school credits as determined by official school records. Typically, juniors are 16 years of age. A senior is a student who is enrolled in high school and has greater than 20 high school credits as determined by official school records. Typically, seniors are 17 years of age.

Gender was classified as either male or female as represented by a school's official record for each student.

School size is the state University Interscholastic League (2016) school size ranking determined as either 1A, 2A, 3A, 4A, 5A, or 6A. This ranking is assigned based on the enrollment headcount of the school and is re-evaluated every two years.

Dependent Variables

English 1301–English 1301 is a common freshman pre-requisite course. It is a gateway course to all future English and liberal arts courses. It is a required course for a general studies Associate degrees and Bachelor of Science or Arts degrees.

Math 1314–Math 1314 is a common freshman pre-requisite course. It is a gateway course to all future Math and Science courses. It is a required course for a general studies Associate degrees and Bachelor of Science or Arts degrees.

History 1301–Is a common freshman level course taken during a student’s first semester in college. It is a required course for a general studies Associate degrees and Bachelor of Science or Arts degrees.

Success in completing a dual credit course is measured by a binary value: pass (grades of A, B, or C) or fail (grades of D, F, W, or Q).

Delimitations and Limitations

Delimitations

The proposed study was delimited to one community college in south Texas. It was also delimited to the predictor variables of age, gender, and school size, and the outcome measures of success in dual credit courses in English, mathematics, and history. This study was also delimited to Alexander Astin’s theory of Student Involvement.

The proposed study was delimited to a community college serving a large geographical area in South Texas. This particular community college was chosen partly due to convenience, but also due to the wide variety of public high schools it serves. It provided the opportunity to examine a large number of high schools of varying sizes from small to large that would not be available from colleges serving strictly urban or rural areas.

The proposed study was delimited to the predictor variables of age, gender, and school size. It did not examine student success based on the variable of ethnicity or race. The Texas common college application utilized by colleges and universities in Texas, particularly by the community college involved in this study, does not require an answer to the race/ethnicity question. Applicants have the option to leave the question blank or choose an option indicating their preference to not disclose. The absence of this data on all students could potentially significantly reduce the pool of study participants.

The proposed study was delimited to the gateway dual credit courses of English 1301, Mathematics 1314, and History 1301. While there are many other course possibilities for first time dual credit students to take, these are three common freshmen courses applicable to all general studies degrees and transferable to all state colleges and universities therefore, providing the largest pool of possible first time dual credit students.

The study was also delimited to Alexander Astin's Theory of Student Involvement (1993). Other theories considered for the study included Chickering and Reisser's Vectors of Development Theory (1993) which examines the natural maturation timeline for students that takes place during the established first year of college. While Chickering and Reisser's theory falls under the same umbrella of Student Development as Alexander Astin's Theory of Student Involvement, it would be difficult to measure the progression of students through these stages of maturation and college adjustment. In addition, college adjustment will not determine success in a college course in the form of earning college credit. The framework for Astin's theory (1993) points to grades as being the number one predictor of student persistence. The outcome for this study was a pass/fail determination which was also the determination if course credit is awarded.

Limitations

The proposed study was limited to classroom setting, course instructors, and students enrolled in public schools. Due to the non-probability nature of the sampling, external validity is limited to the study's participants. Due to the non-experimental nature of the study, no causal inferences will be drawn.

A limitation of the proposed study included the inability to establish classroom setting dynamics. The data collected did not indicate if the student is taking the dual credit course in a face to face setting located on their high school campus, on the college campus, or in an on-line setting. The absence of this data prohibited setting from being a variable examined.

The proposed study was also limited by the course instructors. There was a variety of instructors teaching dual credit courses. These can include high school teachers who meet the teaching qualifications for teaching college level courses, college instructors who teach solely on the college campus, or a qualified instructor who teaches a combination of both at a public high school and the community college. College instructor course assignments is solely the responsibility of the community college and are subject to change from semester to semester depending on the courses offered, the course meeting times, and the employees available to teach. While the course objectives for dual credit courses are standardized, the pedagogy is not. Instructors have the freedom to teach dual credit courses as their teaching styles permit.

The proposed study was also limited to public high school students. While the identified college serves private high schools, they do not use school size rankings as assigned by the University Interscholastic League. The lack of school size ranking would prohibit private schools from being evaluated with the exact same criteria as other study participants.

A final limitation pertained to data availability. Initial discussions with community college administrators stated data were available for all high school students participating in dual credit courses as serviced by the community college. Furthermore, the indication was that a large number of high school students participate in dual credit courses from all levels (freshmen, sophomores, juniors, and seniors) in a pool of over 800 students. However, the state of Texas mandated through House Bill 505 that high school freshmen and sophomores be eligible to take dual credit courses along with juniors and seniors. The state even connected the bill to the higher education master plan, 60x30TX, to increase college student enrollments and graduates. However, the state does not require its agencies to collect data.

Significance of the Study

Recent Texas legislation requires community colleges to accept qualifying high school students upon entering 9th grade for dual credit enrollment. According to the Texas Legislature House Research Organization (2015), the proponents of this bill suggests more students would persist through to attainment of a college degree in less time and less tuition cost. At the time of the proposal of this bill, there was also a consideration for waiving tuition for dual credit students. However, the bill passed does not provide for funding to absorb the cost of waiving dual credit tuition. Consequently, the idea of providing students with an avenue to less out of pocket expenses has not come to fruition. Currently, students are responsible for their own tuition for dual credit courses. The push for students to enroll in college courses as high school freshmen and sophomores could potentially have the opposite affect than hoped. While there is evidence that supports students in 11th and 12th grades, typically ages 16 years old and 17 years old at the beginning of the standard academic year, do well in dual credit courses (Kim, Kirby, & Bragg, 2004), there is no evidence to support the push to include students in 9th and 10th grade,

typically ages 14 years old and 15 years old at the beginning of the standard academic year. In fact, a recent study conducted on community college campuses found older students were more successful in their college courses (Wolfe, 2012). Time and research will be the determining factors if this legislative mandate proves to be positive or negative for Texas dual credit students.

Conclusion

The downward expansion of the dual credit program in Texas may prove to be a large hurdle to clear. The Texas legislature appears to have taken the success of the previous dual credit program which was developed for 11th and 12th grade high school students on academically advanced tracks and removed the grade level entry requirement and the limitations in place of only allowing students to take no more than 6 hours per semester. As the Texas Education Agency is imposing additional high school graduation requirements, the attempt to pile on more college credit in a high school schedule that is extremely tight may prove to be counterproductive to the success of students. The introduction of college level courses as early as 9th and 10th grade can present students, parents, and high school counselors with a serious dilemma should the student prove to be unsuccessful in a dual credit course. Students could very easily find themselves struggling to enroll in credit recovery programs to earn the lost credit in order to stay on track to graduate on time. This proposed study will provide information regarding the academic success factors in dual credit courses.

CHAPTER II:
REVIEW OF THE LITERATURE

Introduction

The relevant research and literature are organized into five major sections. The first section includes the literature detailing the history of dual credit as it relates to the Texas Closing the Gaps mandate in 2000 moving forward to the current year. The second section examines the academic success factors of age, gender, and school size. The third section examines a public policy model. In the fourth section, the study's theoretical framework is discussed. The fifth section provides a summary which includes the databases and sources used to identify the literature.

History of Dual Credit

Historically, dual credit courses began widely as independent partnerships between local school districts and community colleges with little oversight from states in which they were located (Taylor, Borden, & Park, 2015). Iowa, Colorado, Minnesota, Florida, and Wisconsin led the charge in the mid 1980's by actually passing state legislation which adopted postsecondary enrollment options for high school students. While these five states would lead the country in the design and framework for establishing dual credit courses, each state would eventually take ownership of their own dual credit programs in an effort to maximize enrollment and growth of the program (Karp, Bailey, Hughes & Fermin, 2004).

At the turn of the twenty-first century, Texas legislators began an aggressive campaign initiative, which would specifically target increased college enrollment. The initiative known as Closing the Gaps, was aimed at encouraging a higher number of people pursuing a college education and set specific targets of ultimately reaching 630,000 by 2015 with institutional target

goals set in five-year increments (THECB, 2000). Texas state legislators passed and approved many initiatives in an effort to create an easier path to higher education. Dual credit was a product of such an initiative and in 2005, as the realization of the untapped opportunity to significantly increase higher education enrollment came to light. Dual credit in Texas moved from being independent local partnerships to state-mandated programs. All Texas school districts were required to offer a minimum of twelve dual credit coursework hours for qualifying high school juniors and seniors by the year 2008 (Mansell & Justice, 2014). Institutions of higher education would be forced to become creative with enrollment ideas and funding sources in order to execute the higher education plan outlined in the Closing the Gaps initiative (THECB, 2015). By 2010, it became evident the goals of Closing the Gap would not be fully met by the target year of 2015 without the implementation of additional initiatives outlined and aimed at expanding access to dual credit courses by the Texas Higher Education Coordinating Board, Texas Education Agency, and the Texas Legislature (THECB, 2010). The final year of Closing the Gaps marked two significant measures which impacted dual credit. These included the upward and outward expansion which lifted the restrictions that required high schools to have their dual credit needs served solely by the community college assigned to the corresponding service area, and the requirement limiting dual credit opportunities to only qualifying high school juniors and seniors (THECB, 2016). This resulted in high schools partnering with multiple colleges and universities in a deliberate and intentional plan to assure a robust and rigorous dual credit plan to serve all students. High schools were also able to begin shopping for dual credit courses which offered more options as well as better value. The final report for Closing the Gaps reported a significant overall increase of six percent enrollment in statewide dual credit enrollment (THECB, 2016). While state officials are quick to point to increased dual credit

enrollment as a result of Closing the Gaps, Mansfield and Thachik (2016) claimed the numbers would fall far short in the critical populations of students of color and low socioeconomic groups.

The emphasis on access to dual credit courses does not appear to be waning even as the Closing the Gaps initiative has officially ended. The Texas Higher Education Coordinating Board has essentially continued the initiative with the newly implemented 60x30TX higher education strategic plan which is designed to increase college education attainment for the population of Texas. More specifically, the plan outlines that by the year 2030, at least sixty percent of Texans ages 25-34 will have earned a certificate or degree (THECB, 2015). The Texas Higher Education Coordinating Board, strategically and purposefully, aims at significantly increasing the dual credit enrollment in order for the new 60x30TX plan to be fully successful in its implementation. There is however, nothing to support the mandate of increased dual credit population to increased postsecondary graduation rates. As mandated in 2008, all Texas high schools have provided dual credit coursework options to high school juniors and seniors. And while the enrollment headcount has increased significantly, the number of students graduating with postsecondary degrees has arguably declined or remained steady. As the Texas population increases, it should be expected that college degree attainment should also increase. However, the percentages of college attainment have actually dropped or remained steady. In 2010, Texas young adult degree attainment was at a mere 35% which fell well below the national average of 44% (THECB, 2015). There has been no significant connection that identifies access to dual credit courses at an earlier age would increase the number of Texans who earn a college degree. In fact, the data seems to suggest that initiative such as Closing the Gap and 60x30TX simply

open the doors to students already bound for college, just at an earlier age. The result is simply a larger funnel for those entering college, while those leaving via graduation remains the same.

Success Factors

Year in High School

The approval for high school students to begin taking dual credit courses as early as 9th grade raises questions if age and other identifying factors, such as gender and school size, could play a role in student success. The review of the literature suggests this is plausible.

While dual credit courses have gained popularity and provide a gateway entry to college-level coursework, questions continue to rise regarding the college success of increasingly younger college students and the ability to perform academically at the same level of a typical age college freshman. As community colleges face an ever-growing number of students in the developmental coursework pipeline, studies indicate that older students out perform their younger counterparts (Wolfe, 2012). Historically, dual credit courses have been limited to qualifying high school juniors and seniors. While little research exists on the success rate of students based on age, which can be correlated to year in high school of freshmen, sophomore, junior, or senior, Ganzert (2014) found those enrolled in their first dual credit course completed their courses with a lower grade point average. The lower grade point averages were often associated with students taking only one or two dual credit courses. The study also found high school juniors, the minimum year in high school previously allowed in Texas for dual credit enrollment, were less likely to take multiple dual credit courses and more likely to take just one course per semester (Ganzert, 2014). In a comprehensive study of over 2500 Texas high school students in grades 9–12, Bussert-Webb and Zhang (2016) found reading attitude and aptitude scores rose significantly with each grade level and concluded that older students, typically

classified as high school juniors and seniors, performed better than did the younger freshmen and sophomore students.

Gender

Specific areas of high school academic achievement present dominant patterns based on gender. Specifically, while males consistently perform better in mathematics and science courses than do females, their female counterparts outperform them in language courses, liberal arts courses, and overall grade point average (Rahafar, Randler, Vollmer, & Kasaeian, (2017). Borg (2015) explored the idea of gender possibly being a secondary factor to classroom behavior in academic achievement. The study found gender, categorically, is a determining factor in academic success more so than identified classroom behaviors. Longitudinal studies indicate even after specific targeted measures to decrease identified gender gaps, males continue to have a significant advantage in the areas of mathematics and science, while females continue to excel in writing and the arts (Nowell & Hedges, 1988). Overall, females excel in high school at a rate that surpasses their male counterparts in such a way that in an effort to maintain a gender balance at competitive entrance colleges and universities, admissions officers reported the need to lower expectations for males, allowing for a gender-equal student population (Dinan, 2016). While both genders enjoy a different set of advantages and disadvantages in academic achievement, an argument presented by Dinan (2016) asserts educational settings are not structured around the typical male social and emotional makeup. Dinan (2016) pointed to facts such as boys being five times more likely to be diagnosed with attention deficit disorders rendering their ability to focus on schoolwork for longer periods of time difficult thus creating possible opportunities to provide the inability to keep up academically with their female counterparts. A recent study of over 2500 Texas high school students in grades 9-12 measured reading attitudes and aptitudes and found

that overall, females have both significantly greater reading attitudes and aptitudes which translates into higher grades in class and subsequently, higher grade point averages (Bussert-Webb, & Zhang, 2016).

Gender is an inhibiting demographic factor for higher education in general. Males are less likely to enroll in a four-year college as well as in a community college than are their female counterparts, however, males are more likely to enroll in a vocational program after high school (Lichtenberger, Witt, Blankenberger, & Franklin, D 2014). Also supporting this claim is a study conducted by Pretlow and Wathington (2014) during the height of the initial push from Virginia legislators to increase dual credit participants and found that males were significantly and consistently underrepresented in dual credit courses.

School Size

While small class size has long been argued to have a positive impact on student success, Humlum and Smith (2015) found small high school size, identified as schools with less than 400 students, to play a significant role in academic success for students as well as on long-term success in the labor market in the United States. In a longitudinal study covering eighteen years, Humlum and Smith (2015) found students from smaller schools consistently performed better in several identified markers, including academic performance on grade nine exit examinations, suggesting small school size to be a significant factor in successful outcomes. Small school size is considered to be such an important factor that research inquiry on the framework of school reform conducted by Kahne, Sporte, and Easton (2005) found smaller school size to be a necessary condition in order to produce successful student outcomes, at autonomous and independent campuses, and the ability to produce high quality instruction with the academic rigor. Humlum and Smith (2015) also identified additional beneficial measures of smaller

schools such as higher attendance rates and a larger number of students on track to graduate on time.

Measuring student success is challenging. In a study examining school achievement and graduation rates in New York City's promotion and restructuring to implement small school size, students entering one of the smaller schools in grade nine and progressing through grade twelve were more likely to advance in key measures of student progress, including the completion of more school credits at the end of academic year and more likely to be on track to graduate, than the students who remained in the larger schools (What Works Clearinghouse, 2012).

Admittedly, measuring academic success as a result of school size is difficult, and Lindahl and Cain (2012) explored the differences in the definition of small schools and additional variables such as attendance, socio-economic status, and grade level, in order to examine or identify or pinpoint where the size of school actually becomes a benefit for student outcomes, particularly in academic achievement. The results strongly support small school sizes, less than 400 students, to be particularly beneficial for students in grade nine and from higher socio-economic categories.

In a study designed to measure reading aptitude and attitude among Texas high school students of varying school size in which schools were categorized into small, medium, and large, students from the medium size schools with 500–1,000 students scored the highest on these two measures (Bussert-Webb, & Zhang, 2016). The study suggested there is a breaking point in which a small school actually becomes too small in order to achieve the highest academic success in reading aptitude and attitude.

Although the previous discussion provides guidance to understand academic success, more and more public education is guided by public policy. Public policy set the stage for this

study. House Bill 505 requires the high schools to allow participation by freshmen and sophomores in dual credit courses. It does not, however, require an accountability structure, such as data collection, data analysis, reporting, or evaluation of bill effectiveness. This appears counter to the understanding of public policy performance. This study is framed in gaining insights into how well freshmen and sophomores perform in dual credit courses as a matter of public policy. A review of the public policy process (Fowler, 2013) provided a foundation for how dual credit outcomes for high school freshmen, sophomores, juniors, and seniors can be understood in light of House Bill 505.

Public Policy

Best practices in public policy implementation requires specific steps be achieved in order to ensure effective policy writing (Fowler, 2013). The stages involve the following: (a) Issue Definition; (b) Agenda Setting; (c) Policy Formulation; (d) Policy Adoption; (e) Implementation; and (f) Evaluation.

Issue Definition

Identifying an issue often begins with both a written and verbal process. This can be a lengthy process as discussions will take place to develop a problem into a viable issue in which support can be garnered to move forward with the much more visible and critical stages of policy development. The most effective issue definitions are those focused on ideas, values, and ideologies. The cyclical rotation of social values, ideologies, and political atmospheres can be a hindrance for definitions driven by such strong emotional ideals. Fowler (2013) pointed to five elements of skillful issue definitions: (a) claim of a problem; (b) evidence to support the claim; (c) a realistic solution for the problem; (d) effective discourse; and (e) broad appeal to a wide audience.

Claims allow a problem to escalate to become a policy issue. Typically, an interpretation of a problem creates a broad scope causes confusion on initial intentions. Claims typically point to a misinterpretation, confusion, or a social injustice.

Evidence of a claim is required in order to garner support to move a problem forward to becoming a policy issue. The most effective evidence includes dramatic statistics drawn from reputable sources. In addition, personal stories of social injustice serve as effective evidence to support claims of a problem.

Good issue definitions include realistic offers of a solution. Solutions offered will include elements of options available, implementation, and funding options available. An issue definition offered without the component of a solution included is lacking in full scope and will more likely remain a perceived problem rather than moving to net steps in policy development.

Effective discourse can be the most critical factor in defining an issue. Powerful language, often supported with dramatic statistics and expressed with highly emotionally charge language, can provide strength and support needed to move a problem to the policy development stages. Broad appeal to a wide audience is the traction required to move a problem forward. Problems that garner large support are problems that quickly move to the top of legislator's agendas. Often, a policy will seem vague in order to encompass the largest audience as possible. A narrow focus can limit the number of supporters thus reducing the amount of support received (Folwer, 2013).

Agenda Setting

In order for an issue to become policy, it must become part of an agenda. Agenda setting is the process of comprising all issues being discussed at multiple forums including: conferences, journals, among government officials, within the public, and within the media. Fowler (2013)

identifies two types of agendas: (a) systematic; and (b) governmental. While it is possible for an issue to be part of one or both of these agendas, it is critical for an issue to become part of the governmental agenda in order to become policy. Often the two type of agendas interact in such a way that can help an issue reach an agenda, but more often than not it is very difficult for an issue to reach one agenda, and even more difficult to reach both.

The systematic policy agenda is the platform for people outside of government to express concerns and evaluate issues at the forefront of different fields. The systematic agenda is extremely broad in scope often assumes sub-agendas which typically includes a public agenda aspect. The public agenda brings an issue to the point of great importance. The greater support for an issue within the public, the more likely it is to rise to the level of becoming a systematic policy agenda issue.

Governmental policy agenda provides the platforms for issues seriously discussed by policy makers and government officials to gain traction and support. Governmental policy agendas take place at many different levels including: (a) local; (b) state; and (c) federal. Within each of these levels are multiple components such as bills, court cases, legislative action, and many more. For any issue to become policy it must reach the level of governmental policy agenda (Fowler, 2013).

Policy Formulation

Policy formulation is a slow and cumbersome process deliberately designed to be conservative. The multiple layers required for a policy to be introduced as a bill and then pass through multiple approval processes provides abundant opportunities for an issue to lose support and get dropped from an agenda. Policies are formulated through a variety of sources such as legislators, interest groups, chief executors, and state leaders. Bills introduced directly from

government officials have the benefit of being introduced straight into the approval system. This is not the case for bills presented from outside interest groups. These bills have the additional hurdle of making it to a legislator's agenda for approval prior to moving forward to the official approval process (Fowler, 2013).

Policy Adoption

The stage of policy adoption is one in which many bills do not survive. Often, the lack of enough support becomes evident well before it arrives to a vote by officials. If a bill is able to move successfully through the process of becoming policy, or law, it will often suffer major revisions along the way. Multiple obstacles exist that require lawmakers to be flexible and willing to give up some aspects of the original idea or issue. Should a bill make it through the entire approval process, the issue of funding may be the final fatal hurdle for a bill to pass (Fowler, 2013).

Implementation

Policy implementation is the most difficult of the stages as it often involves the coordination of resources outside of the initial policy stages. According to McBeth and Shanahan (2004), implementation is the stage in which adopted policies by local, state, and federal bureaucracies are carried out at the micro-level by form implementers. Intermediaries serve as a communication link between implementers and the policy-makers. These are typically the groups or organizations who are delegated with the responsibility of policy implementation in a broad sense. The intermediaries provide the capacity to implement policy. Typically, this is based on the will and the motivation of the intermediaries, or the agency or group tasked with a policy implementation (Fowler, 2013).

Evaluation

Policy evaluation is arguably the most controversial step of Fowler's six-stage model of policy development. According to Fowler (2013), policy evaluation is difficult as the success, or the unsuccessful policy, can become political and threaten the power of policy creators. This is exactly why it is common to find varying degrees of policy evaluation ranging from stringent, to loosely monitored, to completely unevaluated. The varying degrees of evaluation does not negate the fact that it is imperative all policies be monitored through systematic and rigorous standards that measure policy effectiveness as compared to initial policy goals. Whether the policy evaluated is small or large, according to Fowler's model all should follow the same general evaluation steps (Fowler, 2013). These steps include: (a) determine the goals of the policy; (b) select indicators; (c) select or develop data-collection instruments; (d) collect data; (e) analyze and summarize data; (f) write evaluation report; (g) respond to evaluators' recommendations.

Theoretical Framework

This study is framed around Alexander Astin's Theory of Student Involvement which is a student development theory which allows and adjusts for the many changes that college students experience. Astin's Theory of Student Involvement is a complex theory which encompasses a myriad of identified activities and milestones which are necessary for student persistence, which is the student's ability to remain in college and continue toward the path of degree attainment even though it may not be in the optimal timeframe as outlined by an institutions degree plan. The Theory of Student Involvement is grounded in student persistence, which Astin (1993) defines as the student's ability to persevere through everyday life challenges and adversities and yet, still remain able to continue with their higher education.

Astin identifies a conceptual framework for examining student outcomes, the I-E-O Model. This model measures three elements: (a) Inputs; (b) Environments; and (c) Outcomes. Astin (1993) asserts the I-E-O provides a unique opportunity to examine student development and provides educators and policy makers a better basis for knowing how to achieve desired educational outcomes, including academic achievement.

Inputs refer to the characteristics of the student at the time of entry into college. Input measures can include courses taken in high school, choice of career, reasons for attending college, religious preference, parental occupation, parental income, parental education level, race, ethnicity, age, gender, and marital status. Change or student growth is determined by comparing outcome measures to initial student inputs.

Environmental measures, according to Astin (1993), are different aspects of a student's college experience that can impact both cognitive and emotional outcomes. The Theory of Student Involvement categorizes over 160 environmental measures into six general categories: (a) characteristics of institutions; (b) curriculum; (c) faculty; (d) peer groups; (e) residence, major, and financial aid; and (f) student involvement. Astin contends that student peer groups and characteristics and behaviors of faculty have the most pervasive effect on student's individual development.

Outcome measures are characteristics, knowledge, attitudes, beliefs, and values that exist after a student has graduated. Outcome measures are classified as either Psychological or Behavioral and categorized as Affective or Cognitive (Astin, 1993). For example, academic achievement is classified as Psychological and Cognitive. Astin (1993) identifies high school GPA as the single strongest predictor of college student outcomes (degree attainment) and gender (being female) as being a strong positive predictive factor.

Astin's theory of involvement has five basic assumptions about student involvement: (a) Involvement requires an investment of psychosocial and physical energy; (b) Involvement is continuous, and the amount of energy invested varies from student to student; (c) Aspects of involvement may be qualitative and quantitative; (d) What a student gains from being involved is directly proportional to the extent to which they were involved; and (e) Academic performance is correlated with student involvement (Astin, 1993).

A second theoretical framework considered for this study was Chickering and Reisser's Vectors of Development Theory (VDT) (1993). Vectors of Development Theory identify the college years as the primary window and time frame for identity development which allows for a fluid movement back and forth through identified vectors. Seven vectors contribute to the formation of identity: (a) developing competence; (b) managing emotions; (c) moving through autonomy toward interdependence; (d) developing mature interpersonal relationships; (e) establishing identity; (f) developing purpose; (g) developing integrity (Chickering & Reisser, 1993). Identity development stages occur naturally throughout a young adult's early college experience, and in fact can often be the natural launching point for exploring and establishing identity (Carter, 2014). Chickering and Reisser (1993) asserted typical traditional aged college students only maneuver through the first three vectors as adolescents begin to experience personal achievements, emotional peaks, and the ability to become autonomous while maintaining significant familial relationships. A longitudinal study conducted by Foubert, Nixon, Sisson, and Barnes (2005) supported the assertion of student's progression through the first three vectors throughout their early college freshman and sophomore years suggesting specifically for the first vector, student's ability for developing intellectual social, and physical competence.

The first three vectors specifically speak to developmental progressions that occur naturally during the typical age of freshmen and sophomores in college allowing for the student to maneuver through challenging social and academic situations experiencing both failures and successes, in turn building confidences not yet experienced in a high school setting (Burt & Paysnick, 2014). The emphasis on identity of typical college aged freshmen as examined by Leong, Gibson, Lounsbury, & Huffstetler (2005) indicated the personality traits of agreeableness, conscientiousness, emotional stability, extraversion, and openness were correlating factors in identifying college age freshmen's sense of identity, which in turn found to have a positive correlation to college grade point average and course success. As with many student development theories, the VDT theory provides the structural framework to support the success of dual credit students. However, the success factors are critically dependent on specific elements that are difficult to measure quantitatively which does not fit cohesively with the structure of this proposed study.

A third theoretical framework considered for this study was the Psychosocial Identity Development and Student Affairs. This is a self-identity theory identified by Torres, Jones, and Renn (2009) as a belief system that encompasses one's sense of self with respect to the surrounding environment and other social groups. This identity theory presupposes that student identity development is dependent on several factors: (a) self-identify development beginning from a simple idea and progressing to a much more complicated one; (b) what constitutes an achieved identity; and (c) the role of faculty members and student affairs practitioners in college student development (Torres et al., 2009). This theory asserts that student affairs professionals assist students in their progression through their college career by helping students find a balance between self, others, and nature. This particular identity development theory, while grounded in

the relationship established between the student development and college student affairs interaction with the student, has an attractive component of student success measure of upward movement towards degree attainment, would require the implementation of measurement of student affairs personnel interaction with students. This was not a quantitative measure gathered by this study, therefore making this theory not the most practical for the purposes of this study.

According to Owen (2012), student development theories are predominately rooted in the field of psychology, rendering a strong dependence on the nature of the psychosocial development of a student and making the measurement of academic student success difficult to identify in the context of this study. The fact that Astin (1993) considers characteristics at the point of entry in school and identifies academic success (grades) as a clear predictor of student academic success within the model of Student Involvement makes it an attractive framework for this study as it is an easily measurable factor.

Summary

The push for expanded participation in dual credit courses is designed to increase postsecondary participation; thus; leading to increased graduation rates. While the participation rates have grown due to the pool of available students growing, the number of graduation rates has not increased. Giani, Alexander, and Reyes (2014) noted students who take dual credit courses are those who were more likely to attend and graduate college anyway. It is evident that the push for earlier college participation is actually just lowering the bar for the starting age for college. This may prove to backfire as Astin's theory suggests that older students produce more positive student outcomes (academic achievement) than their younger peers. Student persistence can very likely be difficult to achieve as students can now potentially begin their college career a full four years earlier than traditional college students.

Research conducted by Humlum and Smith (2015), not only supported individual success factors playing a significant role in academic achievement, but also found that when two or more success factors are combined, specifically male high school students in a large school size, the success rates drop even lower. Additional research by Humlum and Smith (2015) also clearly linked the multiple success factors to many of Astin's (1993) identified inputs and environmental effects. The conclusion found by much of the literary research clearly indicates the identified success factors of age, gender, and school size play a significant role in academic achievement. Of greater note, a significant amount of the research supports these success factors, and when framed around Astin's (1993) cognitive psychological outcome measure of academic achievement, the goal of obtaining a greater number of students enrolled in college level courses may be obtained, the end result of increased college graduates may not ever be realized.

Literature used for review in this study was obtained through the Texas A&M Corpus Christi library supported databases. This primarily includes the following databases: ERIC, PsycINFO, and Professional Development Collection. Historical information was also obtained from the Texas Higher Education Coordinating Board.

CHAPTER III

METHODS

Introduction

The purpose of the study was to examine how student characteristics relate to academic success in a first attempt in a dual credit environment. There are two major variables for the study. First, student characteristics is the independent variable. It refers to year in high school (freshman, sophomore, junior, or senior), gender, and high school size. The second is the dependent variable, academic success. Academic success is passing scores in English, mathematics, and history dual credit courses.

Research Questions

The following research questions guide the study:

1. To what extent does the student characteristic of year in high school relate to success in passing a dual credit course on students' first attempt?
 - 1.1 To what extent does year in high school relate to success in passing a dual credit English course on students' first attempt?
 - 1.2 To what extent does year in high school relate to success in passing a dual credit History course on students' first attempt?
 - 1.3 To what extent does year in high school relate to success in passing a dual credit mathematics course on students' first attempt?
2. To what extent does the student characteristic of gender relate to success in passing dual credit course on students' first attempt?
 - 2.1 To what extent does gender relate to success in passing a dual credit English course on students' first attempt?

2.2 To what extent does gender relate to success in passing a dual credit history course on students' first attempt?

2.3 To what extent does gender relate to success in passing a dual credit mathematics course on students' first attempt?

3. To what extent do student characteristics relate to success in passing a dual credit history course on students' first attempt?

3.1 To what extent does year in high school relate to success in passing a dual credit history course on students' first attempt?

3.2 To what extent does gender relate to success in passing a dual credit history course on students' first attempt?

3.3 To what extent does high school size relate to success in passing a dual credit history course on students' first attempt?

4. Are student characteristics proportionate to grades among dual credit students' first attempt in a dual credit English course according to student characteristics?

4.1 Is year in high school proportionate to grades among dual credit students' first attempt in a dual credit English course according to year in high school?

4.2 Is gender proportionate to grades among dual credit students' first attempt in a dual credit English course according to school size?

4.3 Is school size proportionate to grades among dual credit students' first attempt in a dual credit English course according to student gender?

5. Are student characteristics proportionate to grades among dual credit students' first attempt in a dual credit mathematics course according to student characteristics?

- 5.1 Is year in high school proportionate to grades among dual credit students' first attempt in a dual credit mathematics course according to year in high school?
- 5.2 Is gender proportionate to grades among dual credit students' first attempt in a dual credit mathematics course according to school size?
- 5.3 Is school size proportionate to grades among dual credit students' first attempt in a dual credit mathematics course according to student gender?
6. Are student characteristics proportionate to grades among dual credit students' first attempt in a dual credit history course according to student characteristics?
- 6.1 Is year in high school proportionate to grades among dual credit students' first attempt in a dual credit history course according to year in high school?
- 6.2 Is gender proportionate to grades among dual credit students' first attempt in a dual credit history course according to school size?
- 6.3 Is school size proportionate to grades among dual credit students' first attempt in a dual credit history course according to student gender?

Research Design

The research design is ex post facto. As such, it is quasi-experimental and examines data already collected. The data for the study is nominal, therefore analyses are based on frequencies or counts (Leech, Barrett, & Morgan, 2008). The study examined two groups. Characteristics of the groups are first time, high school students who had enrolled in college dual credit courses in English, mathematics, or history. The independent variables for each group are year in high school, gender, and school size. The outcome measure is based on student success, that is, whether they passed the course or not.

Frame

The study took place using data collected from a south Texas community college which serves high schools of varying size located in all, or in part of, seven south Texas counties. The high schools used for this study only consist of students enrolled in public high schools. According to the Texas Higher Education Coordinating Board college admissions standards, collection of projected high school graduation date (used in determining year in high school at the time of enrollment), gender, and high school attended (used for determining high school size), are standard data collected for all students upon admission to a Texas community college. Age is not considered as a variable for the study since House Bill 505 pertains to year in high school. Additionally, age does not necessarily correlate to year in high school.

Population

The population for this study was identified as first time dual credit students at the college in south Texas. Students were concurrently enrolled at a public high school which is served for dual credit coursework by the community college. All students who participated in dual credit courses that the community college services were included in the study. Only those students who completed a dual credit course with a passing or failing grade in English, history, and/or mathematics were included in the analyses.

Participant Selection

The passage of Texas House Bill 505 (2015) lifted previous year in high school restrictions on dual credit students. Beginning with the academic year of 2015-2016, the Texas Higher Education Coordinating Board (THECB) reduced the minimum year in high school for high school students to enroll in dual credit courses from high school junior to high school freshman as mandated by HB 505. The participants were all high school students who enrolled

in dual credit courses for academic years 2015-2016 and 2016-2017. The participants were classified as high school freshmen, sophomores, juniors, or seniors and could be as young as 14 years old. Although age is not a variable, it does raise concern: Are high school freshmen and sophomores academically prepared for college courses? The enrollment was at a community college in south Texas. The courses were English, mathematics, and history. There were approximately 1800 students who took dual credit courses from 2015-2017 at the college identified for this study.

Data Collection

The data were obtained from the Institutional Research office at the college. Data included the initial parameter of first-time dual credit students enrolled in either an English, history, or mathematics course. Additional data included, projected high school graduation date (to determine year high school), gender, and high school attended (to determine high school size). No student names, student identification numbers, or other personal identifiers were requested.

Permission to conduct the study was obtained from the Institutional Review Board (IRB) at Texas A&M University–Corpus Christi (Appendix B). Permission was also obtained from the South Texas community college to conduct the study using the college’s existing data. Requests for data from the community college required a formal request to the college president via email that includes the scope of the project and measures taken to protect the student’s identity. As indicated in Chapter 1, the downward expansion of dual credit coursework by the Texas Legislature for students in grades 9 and 10 only became available beginning in the Fall of 2015. For this reason, data collection from the college was from no earlier than the 2015-2016 school year and beyond in order to ensure the availability of study participants of that age range be

included in the study. Due to the anonymous nature of the study using extant data, consent/assent permission for study participants was not required.

Instrumentation

The data management system used by the college, Banner, is a common management system used by colleges and universities. The data collected are common data collected by every student at the time of application to the college. The data was extracted from the Banner system by the college's Institutional Research personnel. The Banner system requires students to be assigned a code that corresponds to student characteristics at the time of admission to college. All dual credit students are identified by an EA code: EA = Early Admission. Students were identified in this study as EA1; EA2; EA3, etc. for the number of students.

Data Analysis

The data were coded and analyzed, using the Statistical Package for the Social Sciences (SPSS). Data were first examined for descriptive statistics. Data are arranged according to distribution and frequency to bring order to the information. Descriptive statistics provide organization and summarization to data in order to make sense of the information. Descriptive information can present data in forms that are more easily understood (Coladarci, Cobb, Minium, & Clarke, 2008).

A series of chi-square tests were used to examine the relationship between year in high school, gender, school size and students' pass/fail of courses. For research questions one through three, a chi-square of independence was used. This test was used to understand whether year in high school, gender, and school size were related to students' performance in the courses as pass/fail or whether they stand independently. Since House Bill 505 was enacted, no studies

have been conducted to assess whether including high school freshmen and sophomores in college courses relates to their academic success.

For research questions four through six, a chi-square of proportion was to be used. Since House Bill 505 is tied to 60x30TX, the indication is that the state legislature would expect to track student progress and academic success. Research questions one through three addressed that issue on a limited basis. In doing so, the question is asked: How are the proportions of success or failure distributed among the categories? This could give insight into the success of the law and at what year in high school, gender, and high school size, as well as certain courses. However, when the data were submitted from the community college, there were not enough cases for freshmen and sophomores in order to run the chi-square statistic. Logistic regression was, then, used to predict juniors' and seniors' academic success in dual credit courses.

Assumptions for Chi-Square

The first assumption is that data are categorical. Categorical data are not scaled, such as represented on a Likert five-point scale. The second assumption for chi-square is examining differences where 2 x 2 tables are used. With large data sets cells are expected to have 5 or more cases. When analyses yield less than 5 cases, Fisher's exact test is used to report results. Fisher's exact test is a more precise statistical result. The second assumption involves the data not being correlated. It means there is no relationship among cases. They are independent of each other (George & Mallery, 2016).

Assumptions for Logistic Regression

The first assumption is that the dependent variable is dichotomous. The dependent variable in this study includes responses for pass/fail. The second assumption relates to outliers. There should be no outliers. Outliers will be removed and data will be run again. The third

assumption should indicate no multicollinearity among predictors. Predictors less than .90 meet the assumption. The final assumption involves the dependent variable as stochastic. It cannot be predicted precisely. So, the likelihood involvement in a dual credit course is either pass or fail. If the likelihood of pass is yes, it is assumed $p < .05$. If the likelihood is fail, it is assumed $p > .05$ (Statistic Solutions, n.d.).

Moreover, effect size will be calculated. Effect size measure the strength of the relationships. Effect sizes range in score from 1.00 to -1.00. Effects size results closer to 1.00 or -1.00 are considered to have stronger relationships. Effect size pertains to the strength of a connection without giving an account of the relationship in the population. Evaluations of the magnitude of effect size with Cohen's d are (a) small ($d = 0.2$), (b) medium ($d = 0.5$), and large ($d = 0.8$) (Gravetter & Wallnau, 2008).

Summary

Analysis of the data collected attempted to answer the research questions and show a relationship between the independent variables and the outcomes. The information gained will aide in determining the success of dual credit students after the passage of Texas House Bill 505. Upon completion of this study, college and high school administrators may be able to identify factors contributing to the success of dual credit students. This information may be used to provide proactive academic interventions as dual credit students matriculate through first attempts in a dual credit course.

CHAPTER IV

RESULTS

The purpose of the study was to examine how student characteristics relate to academic success in a first attempt in a dual credit environment. There are two major variables for the study. First, student characteristics is the independent variable. It refers to year in high school (freshman, sophomore, junior, or senior), gender, and high school size. The second is the dependent variable, academic success. Academic success is passing scores in English, mathematics, and history dual credit courses.

After data collection it was discovered that of the 826 cases of dual credit courses, only 10 included freshmen and sophomores. Even though House Bill 505 mandated dual credit courses to be offered to high school freshmen and sophomores, the participation rate was extremely low. In an attempt to collect more data, Texas state officials were contacted. State officials replied that data were not being collected for freshmen and sophomores in dual credit courses. Thus, data were examined according to the following: (a) data availability; (b) the addition of statistical analysis with logistic regression; (c) and a direction toward public policy as a “government’s expressed intentions and official enactments, as well as patterns of activity and inactivity” (Fowler, 2013, p. 5).

Statistical Assumptions

Data were checked according to statistical assumptions. Assumptions were met with the exception of outliers in one of the statistical analysis. The outliers were deleted and analyses were completed. In several instances, too few cases were available in categories, therefore data were recoded to where analyses could be completed. Where data did not meet assumptions in chi-square, Fischer’s exact test results were reported, when analyses yielded less than 5 cases. It provides a more precise representation of probability (George & Mallery, 2016).

Statistical Analysis

The initial statistical analyses for the research questions were to be descriptive statistics and chi-square. However, with the lack of data available for freshmen and sophomores, logistic regression was added to analyze the predictive value of student characteristics toward academic success.

Descriptive statistics were calculated for all variables. The SPSS software was used to produce frequency distributions, means, and standard errors when appropriate. The SPSS had analytical capabilities to examine the effectiveness of the independent variables in relation to student success. The researcher used logistic regression and Pearson's chi-square test. Tables 1-7 provide descriptive statistics.

Dual credit data were gathered from fall 2015, spring 2016, fall 2016, and spring 2017 from a community college in South Texas serving seven Texas counties and characterized with year in high school being identified. Freshman and sophomore categories were not included due to too few cases. The results for the remaining categories of junior and senior are presented in Table 1.

Table 1

Year in High School, (N=816)

	<u>Frequency</u>	<u>Percentage</u>	<u>Valid Percentage</u>	<u>Cumulative Percentage</u>
Junior	416	51.0	51.0	51.0
Senior	400	49.0	49.0	100.0
Total	816	100.0	100.0	

Dual credit data were gathered from fall 2015, spring 2016, fall 2016, and spring 2017 from a community college in South Texas serving seven Texas counties and characterized with gender being identified. The results for categories of female and male are presented in Table 2.

Table 2

Gender, (N=816)

	<u>Frequency</u>	<u>Percentage</u>	<u>Valid Percentage</u>	<u>Cumulative Percentage</u>
Female	500	61.3	61.3	61.3
Male	316	38.7	38.7	100.0
Total	816	100.0	100.0	

Dual credit data were gathered from fall 2015, spring 2016, fall 2016, and spring 2017 from a community college in South Texas serving seven Texas counties and characterized with course name being identified. The results for categories of History 1301, English 1301, and Math 1314 are presented in Table 3.

Table 3

Course Name, (N=816)

	<u>Frequency</u>	<u>Percentage</u>	<u>Valid Percentage</u>	<u>Cumulative Percentage</u>
History 1301	341	41.8	41.8	41.8
English 1301	405	49.6	49.6	91.4
Math 1314	70	8.6	8.6	100.0
Total	816	100.0	100.0	

Dual credit data were gathered from fall 2015, spring 2016, fall 2016, and spring 2017 from a community college in South Texas serving seven Texas counties and characterized with course grade 4-point scale being identified. The results for categories of F, D, C, B, and A are presented in Table 4.

Table 4

Course Grade 4-Point Scale, (N=816)

	<u>Frequency</u>	<u>Percentage</u>	<u>Valid Percentage</u>	<u>Cumulative Percentage</u>	<u>Mean</u>	<u>SD</u>	<u>SE</u>	<u>Skew</u>	<u>Kurtosis</u>
F	8	1.0	1.0	1.0					
D	37	4.5	4.5	5.5					
C	160	19.6	19.6	25.1					
B	378	46.3	46.3	71.4					
A	233	28.6	28.6	100.0					
Ttl	816	100.0	100.0		2.97	.87	.03	-.72	.46

Dual credit data were gathered from fall 2015, spring 2016, fall 2016, and spring 2017 from a community college in South Texas serving seven Texas counties and characterized with pass/fail course grade being identified. Since there were too few cases in D and F grade categories, the data were recoded to Pass Fail: D and F = Fail and A, B, and C = Pass. The results for categories of pass and fail are presented in Table 5.

Table 5

Course Grade Pass/Fail, (N=816)

	<u>Frequency</u>	<u>Percentage</u>	<u>Valid Percentage</u>	<u>Cumulative Percentage</u>
Fail	45	5.5	5.5	5.5
Pass	771	94.5	94.5	100.0
Total	816	100.0	100.0	

Dual credit data were gathered from fall 2015, spring 2016, fall 2016, and spring 2017 from a community college in South Texas serving seven Texas counties and characterized with school size being identified. The results for categories of 1A, 2A, 3A, 4A, and 5A are presented in Table 6.

Table 6

School Size, (N=816)

	<u>Frequency</u>	<u>Percentage</u>	<u>Valid Percentage</u>	<u>Cumulative Percentage</u>
1A	14	1.7	1.7	1.7
2A	103	12.6	12.6	14.3
3A	137	16.8	16.8	31.1
4A	248	30.4	30.4	61.5
5A	314	38.5	38.5	100.0
Total	816	100.0	100.0	

Dual credit data were gathered from fall 2015, spring 2016, fall 2016, and spring 2017 from a community college in South Texas serving seven Texas counties and characterized with

school size being identified. Since there were too few cases in the 1A category, data were recoded. Additionally, the recoding made the cases in the categories more equal. The results for categories of school size: 1A; 2A; 3A = small school size; 4A and 5A = large school size are presented in Table 7.

Table 7

School Size Large/Small, (N=816)

	<u>Frequency</u>	<u>Percentage</u>	<u>Valid Percentage</u>	<u>Cumulative Percentage</u>
Small	254	31.1	31.1	31.1
Large	562	68.9	68.9	100.0
Total	816	100.0	100.0	

General Results

The research sought to look at the relationship between high school student characteristics and academic success in dual credit courses. The results are mixed. Chi-square analyses indicated there were statistically significant differences in students' year in high school for English but not history and mathematics. Additionally, the size of a high school was statistically significant for history but not for other subjects. When logistic regression was used, student characteristics in the models were predictive of academic success, overall. However, in some instances, individual student characteristics were predictive of academic success. For example, year in high school was predictive of academic success in English and history but not mathematics. Size of school was predictive of academic success in history but not English and mathematics. No individual characteristics were predictive of mathematics: the interaction of the predictors was needed for statistical significance. Specific results are presented below.

Research Questions

Research Question 1: Year in High School

1. To what extent does the student characteristic of year in high school relate to success in passing a dual credit course on students' first attempt?

1.1 To what extent does year in high school relate to success in passing a dual credit English course on students' first attempt?

1.2 To what extent does year in high school relate to success in passing a dual credit History course on students' first attempt?

1.3 To what extent does year in high school relate to success in passing a dual credit mathematics course on students' first attempt?

There was statistical significance among students year in high school for passing a dual credit course in English: $\chi^2(1, N = 341) = 9.438, p < .01$. Since one cell had an expected count of less than 5, Fisher's exact test was used for the results. Seniors were more likely to pass a dual credit English course according to results from the residuals: Juniors: fail = 2.7; pass = -.6; Seniors: fail = -.1.3; pass = .3. There was a small effect size, .153

There was no statistical significance among students' year in high school for passing a dual credit course in history. Juniors and senior were not independent of each other in passing or failing a history course: $\chi^2(1, N = 341) = 2.645, p = .151$. Since one cell had an expected count of less than 5, Fisher's exact test was used for the results. There was a small effect size, .088.

There was no statistical significance among students' year in high school for passing a dual credit course in mathematics. Juniors and senior were not independent of each other in passing or failing a mathematics course: $\chi^2(1, N = 341) = 4.266, p = .100$. Since one cell had an

expected count of less than 5, Fisher's exact test was used for the results. The results are presented in Table 8.

Table 8
Chi-Square of Year in High School Success in Passing a Dual Credit Course on Students' First Attempt (N=816)

Course		Junior - n	Senior - n	χ^2	<i>p</i>	Effect Size
English	Pass	63	324	9.438	.006	.153
	Fail	8	10			
History	Pass	309	8	2.645	.151	.088
	Fail	22	2			
Math	Pass	12	55	4.266	.100	.247
	Fail	2	1			

Research Question 2: Gender

2. To what extent does the student characteristic of gender relate to success in passing a dual credit course on students' first attempt?

2.1 To what extent does gender relate to success in passing a dual credit English course on students' first attempt?

2.2 To what extent does gender relate to success in passing a dual credit history course on students' first attempt?

2.3 To what extent does gender relate to success in passing a dual credit mathematics course on students' first attempt?

There was no statistical significance among students' gender for passing a dual credit course in English. Males and females were not independent of each other in passing or failing an English course: $\chi^2(1, N = 405) = 2.382, p = .140$. There was a small effect size, .077.

There was no statistical significance among students' gender for passing a dual credit course in history. Males and females were not independent of each other in passing or failing a history course: $\chi^2(1, N = 405) = 1.369, p = .242$. There was a small effect size, .063.

There was no statistical significance among students' gender for passing a dual credit course in mathematics. Males and females were not independent of each other in passing or failing a mathematics course: $\chi^2(1, N = 405) = 1.543, p = .546$. Since one cell had an expected .148. Table 9 shows a summary of the results.

Table 9
Chi-Square of Gender Success in Passing a Dual Credit Course on Students' First Attempt (N=816)

Course		Male - n	Female - n	χ^2	p	Effect Size
English	Pass	145	242	2.382	.140	.077
	Fail	10	8			
History	Pass	131	186	1.369	.242	.063
	Fail	7	17			
Math	Pass	23	44	1.543	.546	.148
	Fail	0	3			

Research Question 3: School Size

3. To what extent does the student characteristic of high school size relate to success in passing a dual credit course on students' first attempt?

3.1 To what extent does high school size relate to success in passing a dual credit English course on students' first attempt?

3.2 To what extent does high school size relate to success in passing a dual credit history course on students' first attempt?

3.3 To what extent does high school size relate to success in passing a dual credit mathematics course on students' first attempt?

There were too few cases in high school sizes 1A and 2A for analyses. Therefore, categories were recoded: 1A, 2A, and 3A = school size small; 4A and 5A = school size large. There was no statistical significance among school size for students for passing a dual credit course in English. Small school size and large school size were not independent of each other in passing or failing an English course: $\chi^2(1, N = 405) = 1.373, p = .277$. Since one cell had an expected count of less than 5, Fisher's exact test was used for the results. There was a medium effect size, .241.

There was statistical significance among school size for students passing a dual credit course in history. Small school size and large school size were independent of each other in passing or failing a history course: $\chi^2(1, N = 341) = 13.256, p < .001$. The effect size was small: .197. According to the residual scores, students at larger schools were more likely to pass history than those at smaller schools: small: pass -.8, fail 2.8; large: pass .6, fail -2.1.

There was no statistical significance among school size for students passing a dual credit course in mathematics. Small school size and large school size were not independent of each other in passing or failing a mathematics course: $\chi^2(1, N = 70) = 2.007, p = .212$. Since one cell had an expected count of less than 5, Fisher's exact test was used for the results. There was a small effect size of .169. Table 10 shows a summary of the results.

Table 10
Chi-Square of High School Size Success in Passing a Dual Credit Course on Students' First Attempt (N=816)

<u>Course</u>		<u>Small</u>	<u>Large</u>	χ^2	<i>p</i>	<u>Effect Size</u>
English	Pass	102	285	1.373	.277	.241
	Fail	7	11			
History	Pass	107	210	13.256	.001	.197
	Fail	17	7			
Math	Pass	19	48	2.007	.212	.169
	Fail	2	1			

Results of Revised Research Questions 4-6

Data were not available for freshmen and sophomore therefore, a different statistical analysis was used to indicate the success of high school students in dual credit English, history, and mathematics courses. Even though the state of Texas mandated that schools provide dual credit courses for high school freshmen, sophomores, juniors, and seniors according to House Bill 505, the state did not require agencies to collect data. Therefore, data do not exist across the state for freshmen and sophomores' performance in dual credit courses. Consequently, the research questions were revised to center on one question: "How do student characteristics predict high school students' success in dual credit English, history, and mathematics courses?" To analyze the data for the question logistic regression was used for analysis. Logistical regression uses nominal data to predict outcomes.

Revised Research Question 4

How do student characteristics predict high school students' success in dual credit English courses?

The omnibus test of model coefficients showed the overall model performed well: $\chi^2(3, N = 405) = 11.035, p < .05$. However, the Hosmer and Lemeshow test does not confirm the

adequacy of the model: $\chi^2(4, N = 405) = 9.733, p < .05$. The Hosmer and Lemeshow test must exceed .05 to be considered significant. Additionally, the model only explains approximately 3% to 9% of student success: -2 Log likelihood = 136.239, Cox and Snell R-Square = .027 and Nagelkerke R-Square = .088. The current pass rate 95.6% and the predicted pass rate remained the same, 95.6%. Overall, student characteristics serve as predictors for student success in English dual credit classes: Wald $\chi^2(1, N = 405) = 161.903, p < .001$.

Table 11
Student Characteristics as Predictors of Student Success in English (N = 405)

<u>Characteristic</u>	<u>B</u>	<u>df</u>	<u>Wald χ^2</u>	<u>p</u>	<u>SE</u>	<u>Exp (B)</u>
Yr. in School	1.439	1	8.322	.004	.499	4.215
Gender	-.710	1	2.060	.151	.495	.491
Size of School	.580	1	1.297	.255	.509	1.786
Constant	1.981	1	11.631	.001	.581	7.251

Year in High School for English can predict success as it stands alone. Whereas, gender and school size do not. Whereas only year in school stands alone as predictive and yet the overall model is statistically significant, the model accounts for how the predictors interact. Additionally, the B values for statistically significant predictors show the direction and likelihood of academic success. The higher the number and the positive direction indicate the greater the proportion of students in those categories the more likely they are not to be successful. Moreover, the Exp(B) value indicates the odds of being successful. Those students in the year in high school category are likely to be successful. The higher the value (greater than 1) the likely they are to be successful. Taken in conjunction with the chi-square analysis above, seniors are more likely to be successful than juniors according to results from the residuals: Juniors: fail = 2.7; pass = -.6; Seniors: fail = -.1.3; pass = .3.

Revised Research Question 5

How do student characteristics predict high school students' success in dual credit history courses?

The omnibus test of model coefficients showed the overall model performed well: $\chi^2(3, N = 341) = 18.885, p < .05$. However, the Hosmer and Lemeshow test does not confirm the adequacy of the model: $\chi^2(3, N = 341) = 2.637, p < .05$. Additionally, the model only explains approximately 5% to 14% of student success: -2 Log likelihood = 154.768, Cox and Snell R-Square = .054 and Nagelkerke R-Square = .135. The current pass rate 93% and the predicted pass rate remained the same, 93%. Overall, student characteristics serve as predictors for student success in history dual credit classes: Wald $\chi^2(1, N = 341) = 146.608, p < .001$.

Table 12
Student Characteristics as Predictors of Student Success in History (N = 341)

<u>Characteristic</u>	<u>B</u>	<u>df</u>	<u>Wald χ^2</u>	<u>p</u>	<u>SE</u>	<u>Exp (B)</u>
Yr. in School	-2.321	1	6.434	.011	.915	.098
Gender	.559	1	1.388	.239	.474	1.749
Size of School	1.865	1	12.695	.000	.524	6.458
Constant	1.641	1	29.875	.000	.300	5.160

Year in High School and size of school for history can predict success as they stand alone. Whereas, gender does not. Additionally, the B values for statistically significant predictors show the direction and likelihood of academic success. The higher the number and the positive direction indicate the greater the proportion of students in those categories the more likely they are not to be successful. In contrast, the higher the number and the negative direction indicate the greater proportion of students in the category, the more likely they are not to be successful. Moreover, the Exp(B) value indicates the odds of being successful.

Those students in the year in high school category are less likely to be successful. The lower the value (less than 1) the more likely they are to be less successful. Taken in conjunction

with the chi-square analysis above, seniors are less likely to be successful than juniors according to results from the residuals: Juniors: fail = -.3; pass = .1; Seniors: fail = 1.5; pass = -.4.

Those students in the size of school category are likely to be successful. The higher the value (greater than 1) the more likely they are to be successful. Taken in conjunction with the chi-square analysis above, students in large schools are more likely to be successful than students in small schools according to results from the residuals: Large: fail = -2.1; pass = .6; Small: fail = -2.8; pass = -.8. Additionally, in the model itself, size of school ($B = 1.865$) lends itself toward more academic success than year in school ($B = -2.321$). If a student is a junior at a large school, he or she has the likelihood of being academically successful in History over seniors in smaller schools in history.

Revised Research Question 6

How do student characteristics predict high school students' success in dual credit mathematics courses?

The omnibus test of model coefficients showed the overall model performed well: $\chi^2(3, N = 70) = 6.179, p < .05$. However, the Hosmer and Lemeshow test does not confirm the adequacy of the model: $\chi^2(4, N = 70) = 2.556, p < .05$. Additionally, the model only explains approximately 8% to 28% of student success: -2 Log likelihood = 18.589, Cox and Snell R-Square = .084 and Nagelkerke R-Square = .284. The current pass rate 95.7% and the predicted pass rate remained the same, 95.7%. Overall, student characteristics serve as predictors for student success in mathematics dual credit classes: Wald $\chi^2(1, N = 70) = 27.703, p < .001$.

Table 13

Student Characteristics as Predictors of Student Success in Mathematics (N = 70)

<u>Characteristic</u>	<u>B</u>	<u>df</u>	<u>Wald χ^2</u>	<u>p</u>	<u>SE</u>	<u>Exp (B)</u>
Yr in School	1.913	1	2.162	.141	1.301	6.776
Gender	18.041	1	.000	.998	7875.657	68382392.60
Size of School	1.258	1	.924	.336	1.309	3.519
Constant	.943	1	1.041	.308	.924	2.567

Even though the overall model is statistically significant, predictors individually are not.

This is a result of how the predictors interact for statistical significance.

The results are mixed as to how student characteristics relate to academic success. It is noteworthy that for history and English year in school is statistically significant. It further raises the question as to how well freshmen and sophomores would perform in dual credit courses. House Bill 505 mandates that schools provide opportunities for freshmen and sophomores to take dual credit courses but does not require state agencies to collect data. With the lack of data, the phenomenon needs further exploration. This can be done by framing the issue through the lens of public policy. “Public policy is the dynamic and value-laden process through which a political system handles a public problem” (Fowler, 2013, p. 5).

Public Policy

House Bill 505 was developed for the purpose of not limiting the number of dual credit courses a high school student can take and allowing high school students the availability to enroll in dual credit courses as early as 9th grade. This study sought to examine the effectiveness of high school freshmen and sophomores compared to high school juniors and seniors enrolled in a first attempt in a dual credit course pertaining to student success. However, the lack of adequate participation data for freshmen and sophomores prompted an inquiry to the Texas Higher Education Coordinating Board regarding the acquisition of statewide data. Year in high school data for dual credit students is not gathered on a statewide basis. With the lack of state data on

high school freshmen and sophomores pertaining to House Bill 505, conclusions will be drawn from a public policy discussion. That discussion will be framed in Fowler's 6-stage model (2013): (a) Issue Definition; (b) Agenda Setting; (c) Policy Formulation; (d) Policy Adoption; (e) Implementation; and (f) Evaluation.

Issue Definition

The process of identifying a policy issue begins with a problem that can be addressed by government intervention. It is a process that can take a lengthy amount of time or can be accomplished quickly, depending on the amount of written and verbal communication required to come to an agreed upon problem. Often, the identification of a problem is developed in an attractive or political setting which is more likely to garner as much support as possible. Fowler (2013) identified five elements of skillful issue definition: (a) Claim of a problem; (b) Evidence to support the claim; (c) a Realistic solution for the problem; (d) Effective discourse; and (e) Broad appeal to a wide audience.

Agenda Setting

Policy agenda is the ideas and issues that are under discussions and at the forefront of both governmental and professional bodies. These are the ideas and issues that tend to garner the most support by public officials, lobbyist, and public officials. Fowler (2013) identified two types of agenda: (a) Systematic and (b) Governmental. The systematic agenda, outside of the governmental body, are typically broad-based, and have competing sub-agenda such as professional agendas, media agendas, and public agendas. Systematic agendas quite often never rise to the level of governmental agendas. The governmental agenda is one that is much heftier, has already garnered support from government officials, and is more likely to reach a level of official action.

Policy Formulation

Policy formulation is the stage in which the critical formulation of a policy is developed into written language. This process is extremely critical as the shift in words, or their meanings, can alter the meaning or the success of the policy. Fowler (2013) identified the written formulation and the identification of funding for a policy as critical factors in the policy formation stage.

Policy Adoption

Policy adoption is the most visible stage of the 6-stage policy process. Fowler (2013) identified legislature, administrative agencies, and courts as the three arenas in which policy adoption can occur. For policy adoption through legislative means, both houses must vote with a majority rule and the approval of the current executive must be garnered. Administrative agencies write rules, or policies, that are implemented with directives. Court policy adoption is usually implemented through a panel of judges implementing judicial decisions to be enforced. The three general approaches for influencing policy adoption are: (a) government relations; (b) professional organization; and (c) lobbying.

Policy Implementation

Policy implementation is often the most visible and criticized stage in the policy 6-stage model. During the implementation stage, the policy is scaffolded downward to the people and organizations effected by the policy. Typically, the responsibility of implementation rests on the shoulders of individuals who were not involved in the previous stages of development, often leaving the implementation stage to flounder before a full and complete implementation is enforced. As most implementers of approved policy are not involved during the formation or adoption of policy, often implementation can result in the policy looking differently than

originally intended. According to Fowler, (2013) successful implementation is dependent on the motivation and the capacity of the intermediaries.

Assessment

Policy evaluation is one of the most critical phases of policymaking and can also be the most difficult. According to Fowler (2013), evaluation is the systematic evaluation of programs, projects, and any of their components. Assessment is an applied research that involves rigorous evaluations of standards to ensure that policies are meeting goals and to what extent. Fowler's 6-stage model for policy development is dependent on the Assessment stage which include: (a) determine the goals of the policy; (b) select indicators; (c) select or develop data-collection instruments; (d) collect data; (e) analyze and summarize data; (f) write evaluation report; and (g) respond to evaluators' recommendations.

Summary

Chapter IV presented a description of data analyses examining how student characteristics relate to academic success in a first attempt in a dual credit environment. There are two major variables for the study. First, student characteristics are the independent variables. It refers to year in high school (freshman, sophomore, junior, or senior), gender, and high school size. The second is the dependent variable, academic success. Academic success is passing scores in English, mathematics, and history dual credit courses. The purpose of the study was to examine how student characteristics relate to academic success in a first attempt in a dual credit environment.

There were multiple analysis used for the research questions. The researcher used SPSS software to conduct all analyses. Logistical regression was used to indicate the success of high

school students at the junior and senior levels in dual credit English, history, and mathematics courses. A summary of the study is provided in Chapter V.

CHAPTER V

Introduction

This study examined how student characteristics relate to academic success in a first attempt in a dual credit course. The relationship was based on the policy decision in House Bill 505 to expand the dual credit program downward to include high school freshmen and sophomores in addition to the previous regulations which restricted dual credit enrollment to only high school juniors and seniors. There are two major variables for the study. First, student characteristics is the independent variable. It refers to year in high school (freshman, sophomore, junior, or senior), gender, and high school size. Year in high school refers to freshman, sophomore, junior, and senior. Gender is male or female. High school size is large or small, where large includes schools classified as 5A and 4A, and small includes schools classified as 3A, 2A, and 1A. The second is the dependent variable, academic success. Academic success is passing scores, of which students have earned grade of an A, B, or C in a first attempt in a dual credit course in English, mathematics, and history.

House Bill 505 became effective beginning in the academic semester fall 2015 for all qualifying dual credit students. The bill lifted prior restrictions imposed by rules enacted by the Texas Higher Education Coordinating Board on the number of dual credit hours a high school student could enroll in per semester and the total number of overall dual credit hours a high school student could complete prior to high school graduation. In addition, House Bill 505 lifted previous rulings by the Texas Higher Education Coordinating Board that restricted dual credit enrollment to high school juniors and seniors. Beginning with the fall 2015 semester, any qualifying high school student in grades 9-12 was eligible to enroll in a dual credit course. The bill essentially opened the doors to dual credit to every eligible high school student. This study

attempted to analyze data relating to the passage of House Bill 505, specifically the success rates of high school students by high school classification, school size, and gender.

General Conclusions

Results for the study are mixed regarding the relationship between student characteristics of year in high school, gender, and school size and student success in a first attempt in a dual credit course of either English, history, or mathematics. In some cases, student characteristics independently relate to student success, while in others they do not. Results were also produced which support the interaction of student characteristics the success of a first attempt in a dual credit mathematics course. These mixed results show the importance of understanding the impact of student characteristics both individually and collectively.

A particularly important aspect of the study arose as data analysis revealed the lack of a significant number of high school freshmen and sophomores in the data group collected from the community college for analyses. The researcher contacted the community college and confirmed the data only included 10 freshman and sophomores from 826 participants. This discovery led to follow-up inquiries at the state level with the Texas Higher Education Coordinating Board (THECB) and the Director of Institutional Data Collection, Mr. Doug Parker (personal communication, August 24, 2017). This inquiry revealed the state does not collect year in high school data on high school dual credit students. The state's method of collection from state colleges and universities on dual credit students only require minimal coding for dual credit indicating only if a student is a dual credit student or not. The year in high school is a data point not collected at the state level. This information should raise several concerns for state legislators. The first is that after two full years of House Bill 505 being in place, there is an indication of extremely low number of high school freshmen and sophomores either taking

advantage of, or eligible for the provisions afforded by House Bill 505. Second, the lack of a statewide systematic data collection process in order to provide in depth, effective analysis is alarming. Texas legislators will, at some point, need to reconsider this decision in order to make continued improvements to the dual credit program in Texas.

The Texas college common application for community colleges and universities requires students to provide a graduation date or an anticipated high school graduation date. This date was evaluated based on the year and semester of enrollment and subsequently converted to year in high school for the purpose of this study. Anticipated high school graduation date is a data component that is not currently collected by the Texas Higher Education Coordinating Board. Therefore, it is not possible to obtain information at a state level regarding the success of dual credit students in a first attempt in a dual credit English, history, or mathematic course based on the characteristic of year in high school as outlined by House Bill 505 and used as a variable this study.

This is problematic in that House Bill 505 is a policy that specifically allows for high school freshmen and sophomores to enroll in dual credit courses where they were not before. However, there are no measures in place to collect data in order to effectively evaluate the validity of this policy since its implementation. The lack of data led to revisions of research questions four, five, and six to examine the relationship of student success of high school juniors and seniors in dual credit English, history, and mathematics courses. Therefore, the lack of data on freshmen and sophomores led to analyses of how student characteristics are predictive of student success. The statistical analysis was logistical regression.

Conclusions

The community college chosen for this study serves diverse communities in the areas of south Texas. This college serves a variety of public high schools that are of varying sizes, academic ratings, and demographics. This college provided data for the majority of high schools in the seven Texas counties served by the college. Very small schools with a high school classification size of 1A or 2A had too few cases of dual credit participants to analyze individually. Therefore, school size categories were collapsed with 1A, 2A, and 3A being classified as a small school, and 4A and 5A being classified as a large school.

The participation for high school freshmen and sophomore from the college chosen for the study was too small to be included in the study. The student characteristic of year in high school was reduced to include only high school juniors and seniors. Even though student characteristics were revised, it is important to clearly understand that all three inputs examined for this study: (a) year in high school; (b) gender; and (c) school size, were significant factors in the success of a first attempt in a dual credit course, whether it was independently or collectively. This leads to questions regarding other inputs that would be impactful on successful course completion.

Research Question 1: Year in high school

1. To what extent does the student characteristic of year in high school relate to success in passing a dual credit course on students' first attempt?
 - 1.1 To what extent does year in high school relate to success in passing a dual credit English course on students' first attempt?
 - 1.2 To what extent does year in high school relate to success in passing a dual credit History course on students' first attempt?

1.3 To what extent does year in high school relate to success in passing a dual credit mathematics course on students' first attempt?

The study found that there was statistical significance for year in high school for dual credit students taking an English course. There was no statistical significance for year in high school in history or mathematics. Interestingly, English is the only course that high school students are required to take in order to obtain four credits toward graduation from high school (Texas Administrative Code 19, Chapter 74, Subchapter B, Section 74.12). Students take English, whether dual credit or not, during all four years of high school. This is not the case for history and mathematics. This could provide an explanation for the higher success rates among seniors in a dual credit English course. High school seniors are much more motivated to be successful in a course that is required for graduation under the strain of not having a window of opportunity to make up a failed course that juniors enjoy.

Research Question 2: Gender

2. To what extent does the student characteristic of gender relate to success in passing a dual credit course on students' first attempt?

2.1 To what extent does gender relate to success in passing a dual credit English course on students' first attempt?

2.2 To what extent does gender relate to success in passing a dual credit history course on students' first attempt?

2.3 To what extent does gender relate to success in passing a dual credit mathematics course on students' first attempt?

The study found that there was no statistical significance for gender for dual credit students in English, history, or mathematics courses. Both genders, male and female, performed

at the same level. With regard to participation, though, more females (500) participated in dual credit courses than males (316). This supports enrollment trends in other parts of the country (Pretlow & Wathington, 2014), as well as community college enrollment trends (Lichtenberger, Witt, Blankenberger, & Franklin, 2014). Moreover, males tend to perform better in mathematics and sciences courses than and females perform better in language and liberal arts courses females (Rahafar, Maghsudloo, Farhangnia, Vollmer, & Randler, 2016). However, the result from this study, with regard to Pass/Fail grades for college credit versus actual GPA, there were no gender differences in any of the subjects. Although GPA may be important for admission criteria at some colleges and universities, with regard toward obtaining college credit, a passing grade may be sufficient toward earning a degree at other institutions.

Research Question 3: School Size

3. To what extent does the student characteristic of high school size relate to success in passing a dual credit course on students' first attempt?
 - 3.1 To what extent does high school size relate to success in passing a dual credit English course on students' first attempt?
 - 3.2 To what extent does high school size relate to success in passing a dual credit history course on students' first attempt?
 - 3.3 To what extent does high school size relate to success in passing a dual credit mathematics course on students' first attempt?

The study found that there was statistical significance for school size for dual credit students taking a history course. There was no statistical significance for school size for English or mathematics. Students from a large school are more likely to pass a dual credit course than students from a small school size. This tends to be contrary to some literature. Humlum and

Smith (2015) found small high school size, identified as schools with less than 400 students, to play a significant role in academic success for students as well as on long-term success in the labor market in the United States. Kahne, Sporte, and Easton (2005) found smaller school size to be a necessary condition in order to produce successful student outcomes, at autonomous and independent campuses, and the ability to produce high quality instruction with the academic rigor.

The results of this study showed different outcomes than national results. This could be because of the curricular structure in Texas. Students have a full year of history as 8th graders and an additional full year of history which includes an End of Course assessment typically before their junior year in high school (Texas Administrative Code 19, Chapter 74, Subchapter B, Section 74.12). It is plausible the student's early exposure to history, which includes a cumulative assessment, provides a significant educational foundation in history that proves to be beneficial in future dual credit history courses. The larger school size may provide more resources for students to be successful.

Revised Research Question 4

How do student characteristics predict high school students' success in dual credit English courses?

The study found overall, that student characteristics do serve as predictors in English dual credit courses. Year in high school can predict success in a dual credit English course, but not in a dual credit history or mathematics course. As outlined earlier, English is the only subject high school students are required to have four years of credit in order to graduate (Texas Administrative Code 19, Chapter 74, Subchapter B, Section 74.12). The consequences of not passing an English class during a senior year in high school will prohibit a student from

graduating. Even though failing an English class as a junior has consequences of having to re-take the class, high school juniors have an additional year to accomplish this before jeopardizing graduation opportunities. Although year in high school can be predictive of academic success with juniors and seniors, it raises questions as to whether freshmen and sophomores will experience success as well. House Bill 505 was implemented so high school freshmen and sophomores could participate in dual credit courses for college credit. If data were available on freshmen and sophomores, it could help with advising at both the high school and college levels.

Revised Research Question 5

How do student characteristics predict high school students' success in dual credit history courses?

Overall, the study found student characteristics do serve as predictors in history dual credit courses. School size can predict success in a dual credit history course, but not in a dual credit English or mathematics course. The design of curriculum in Texas schools has students completing all of the history courses and End of Course assessments required for graduation typically by the end of their sophomore or junior year in high school (Texas Administrative Code 19, Chapter 74, Subchapter B, Section 74.12). High school juniors and seniors taking dual credit history courses are receiving history credit for a college transcript and an elective credit for their high school transcript. The foundation for student's knowledge in history is very strong prior to enrolling in a dual credit course. Larger school sizes performing better than smaller school sizes may be the result of a larger pool of students participating in the courses. However, measuring academic success as a result of school size is difficult, and Lindahl and Cain (2012) explored the differences in the definition of small schools and additional variables such as attendance, socio-economic status, and grade level, in order to examine or identify or pinpoint where the size of

school actually becomes a benefit for student outcomes, particularly in academic achievement. They found small school sizes, less than 400 students, to be particularly beneficial for students in grade nine and from higher socio-economic categories. The results of this study, along with Lindahl and Cain (2012) suggests that in order to examine how well Texas House Bill 505 is performing, data on freshman and sophomore need to be collected and analyzed. With the lack of data, a critique of the policy is warranted, which is provided later in this chapter.

Revised Research Question 6

How do student characteristics predict high school students' success in dual credit mathematics courses?

Overall, student characteristics serve as predictors in dual credit mathematics courses. Individually however, the student characteristics do not serve as predictors for success in a dual credit mathematics course. These results point to an importance for all three characteristics to interact in order to achieve the statistical significance. This supports the premise of this study that student characteristics of high school classification, gender, and school size have a significant relationship with the success of students in their first attempt in dual credit courses, but more importantly all characteristics collectively play a significant role in the prediction of student success in a dual credit mathematics course. The collective interaction of student characteristics may be similar to a compound effect producing success in a student's first attempt in a dual credit course. In a similar study, Glaesser and Cooper (2012), found the student characteristics of gender, socioeconomic status, and school type to play a significant role collectively to produce academic success.

College mathematics courses have some of the highest failure and college withdrawal rates, and according to a recent study a holistic review points to reasons that are nonacademic

related (Acee, Barry, Flaggs, Holschuh, Daniels, and Schrauth, 2017). The study found student characteristics, such as student engagement, finances, and gender are just some of the issues that function together in the success of a college mathematics course. This study found when multiple student characteristics are present simultaneously, students are more likely to be successful in the more difficult mathematics college courses. This supports the results found in the dual credit courses that show students are more successful with a combination of the student characteristics examined.

Discussion

This study was guided by Alexander Astin's Theory of Student Involvement, which is an umbrella theory covering many critical elements including student persistence throughout the student's pursuit of degree attainment. Astin (1993) identified a conceptual framework for examining student outcomes, the I-E-O Model. This model measures three elements: (a) Inputs; (b) Environments; and (c) Outcomes. Inputs refer to the student's personal background and educational characteristics brought with the student as they embark on their postsecondary education. These include demographic information, previous educational achievement, and self-perceptions. Environments are characteristics most easily controlled and relate to the student's experience while in college. Whereas, outcomes are beliefs and attitudes which are measured after a student's postsecondary education. The I-E-O model provides a holistic approach to better understand how a variety of inputs and environments can work together to garner outcomes in a student's academic experience. Astin (1993) asserted the I-E-O provides a unique opportunity to examine student development and provides educators and policy makers a better basis for knowing how to achieve desired educational outcomes, including academic achievement.

Inputs

Student inputs are characteristics that provide either a measurable growth or change, or a performance or predictive relationship to outcome measures. While outcome measures of academic success in a dual credit course was measured as pass or fail, this study examined specific inputs that may have a performance or predictive relationship with the outcome performance. Inputs of this nature can be related to the types of environment exposures or demographic variables that create a possibility of a relationship (Astin, 1993). The results of this study found a relationship between the environmental inputs selected, which were demographic in nature, and the performance in a student's first attempt in a dual credit English, history or mathematics course.

Specific inputs for this study, gender, year in school, and school size showed student characteristics can assist educators in understanding opportunities for academic success in first time dual credit courses. As outlined in the results, a student's year in high school is an input characteristic that is impactful in a student's first attempt in a dual credit English course. Likewise, school size and year in school are input characteristics effecting the success in a student's first attempt in a dual credit history course. Finally, the results of this study found the interaction of all three inputs played a significant role in the success of a student's first attempt in a dual credit mathematics course. While this study examined three inputs, it is important to realize there are so many more inputs identified by Astin (1993) with the potential to be impactful on first time dual credit course attempts. Personal and educational background experiences of students in high school, especially underclassmen, are understandably reduced due to the reduced age of dual credit students.

While inputs for this study involved high school students' year in school, gender, and school size, Astin's (1993) model takes into consideration an array of factors. An evolution in the structure of education requires an examination of non-traditional inputs. Traditional inputs are resulting in small impacts, suggesting broader definitions of inputs be examined (Parker et al., 2004). As public policy drives curricular issues more and more (e.g., H.B. 505), the inputs are expanding. Inputs, such as year in high school, high school diploma completion progress, course sequence, and dual credit availability become increasingly important for student success.

A student's year in high school, freshman, sophomore, junior or senior, is an input that relates to student success in multiple ways. While cognitive abilities of students in different high school classifications can be similar, the maturity levels can have large variances. These differences are often clearly present when a combination of students with different high school classifications are enrolled in the same class. This raises many questions regarding the maturity, particularly of high school freshmen and sophomores, and the discussions that may take place in a college course, especially one which may have typical college age freshmen and sophomores. Parker et al. (2004) argued the potential for developmental change emotionally in students in the duration from grades 9 to 12 as significant enough to provide large impacts on school attendance, school involvement, and completing school work which, in turn, effect academic performance.

Course mapping involved in obtaining a high school diploma continues to have very little opportunity for student failure, especially as a student progresses each year closer toward graduation. Texas high school graduation requirements often create an extremely tight schedule with very little flexibility (Texas Administrative Code 19, Chapter 74, Subchapter C, Section 25). Should high school freshmen take a dual credit English and history course and fail these courses, the student is missing a full credit of both subjects, which becomes difficult to make up

through a normal high school academic schedule. The subsequent sophomore year is not designed to accommodate the additional required courses from the previous year. Additionally, courses, such as high school English are established as prerequisites for each subsequent year. If a high school freshman or sophomore fails a dual credit English course, they lack the prerequisite credit to take the subsequent English course. Without making the credit up immediately, the missing credits begin to snowball, making it extremely difficult to graduate on time. Often, the only solution is attending summer school in order to maintain a reasonable opportunity to graduate on time.

Course sequencing and scheduling are also an input that should be driving future policy. High school courses are primarily structured around a one-year or two semesters timeframe. In contrast, college courses are structured on a semester timeframe. This makes the mixing of high school courses and schedules difficult to co-mingle with college courses. In addition, most high school courses are designed to meet daily and college courses are designed to meet two or three times per week. This mix in scheduling not only creates large obstacles for high school administrators and counselors in schedule planning, but also creates opportunities in producing learning gaps. Gallo and Odu (2009) found students' academic performance and cognitive retention is significantly better when academic courses meet as many times during the school week as possible. For the most part, the current structure leaves high school students with no real class assignment for either two or three days per week when the dual credit course does not meet. Typically, students are assigned to a study hall or the library for the alternate days the college dual credit courses do not meet. This is an ineffective use of time and could be used more productively if scheduling was adjusted either on the part of the college or on the part of the high school. As high school courses and college courses continue on this pathway of

merging together, it is imperative to adjust one, or both, scheduling structures to become more symbiotic.

Dual credit was designed to provide an early entrance to college and has evolved through the state of Texas' higher education master plans, Closing the Gaps and as outlined in the follow-up 60x30TX plan, to increase college enrollment and the number of college credit hours earned by dual credit students. While the broad goal is to increase these numbers, it will be difficult for student enrollment to increase as colleges continue to offer primarily the same dual credit courses each semester. It is easy for a student to enroll in foundational English, history, and mathematics dual credit courses. It is more difficult to take anything outside these basic courses due to lack of course offerings for dual credit students. A recent study of dual credit courses in high schools offering minimal basic courses are creating a limiting effect on student's progression through college and may in fact be creating a stopgap barrier once students complete the initial basics and have no other dual credit options available (Taylor, 2015). Colleges and high schools have yet to master the logistics of offering dual credit courses that fall outside of these basic core courses. For example, science courses, such as biology, chemistry, and physics are courses containing a lab component. Schools have not been able to configure high school schedules to meet the college schedules that include time for a lengthy lab class. If dual credit options are truly going to continue to expand for high school students, high schools and colleges will need to be willing to adjust their schedules in such a way that truly encourages student participation in all classes, not just the core subjects which have always been available.

Environment

Environmental variables are aspects of an experience which both independently and collectively contribute to outcomes. Evaluating environmental variables can be difficult as each

variable can independently be significant in outcome measures, or a combination of environmental variables can act together to be reflected in outcome measures. For dual credit courses hosted by the college for this study, environmental factors include, but not limited to, course structure, faculty credentials, course delivery, tuition, and approval to enroll by high school administrators. According to Astin (1993), environmental variables hold a certain degree of interpretive difficulties as perceptions for environmental variables due to personal preferences for different variables exist. This study measured the outcomes of first time dual credit students who conceivably, have not established personal preferences for these measures prior to enrolling. Environmental variable provide stronger effects as individual preferences grow and develop with exposure (Astin, 1993)

While this study specifically examined three input factors and the success of students in a first attempt dual credit course, environmental measures are characteristics related to student success. Specific environmental factors for dual credit students include course structure, faculty characteristics, and tuition payment structure. Course structure varies in dual credit environments. House Bill 505 does not concern itself with structure, therefore schools, colleges, and universities can determine the locale, setting, and classroom assignment. While these environmental issues may relate to student success, there is no standardized approach to the environment. Thus, courses could be held on a high school campus or college campus or approved locations. The concern is not where courses are held, but that they are available high school students. Similarly, HB 505 does not mandate discrete faculty qualifications. As long as faculty are qualified in the subject matter, they would be allowed to teach dual credit courses. It is conceivable that college faculty are teaching high school students, a population with whom they may be very unfamiliar. House Bill 505 does not include provisions for tuition payment

structure. High school dual credit students are assessed the same tuition per credit hour as college students. The structure for community colleges is such that high schools located within the local taxing district are assessed a reduced tuition than high schools outside of the local taxing district. The varying tuition costs have resulted in high schools seeking relief in funding through educational foundations, memorandums of understanding for reduced funding, or seeking dual credit from institutions outside of their designated service area. The predictors for this study, though, were those that are generally held constant as found in the literature.

While Astin (1993) asserted educational administrators have the most control over environmental measures, the challenge in the dual credit program in Texas is in the inability to provide similar environments in high schools across the state. So many more environmental factors may be considered, particularly since courses have collegiate expectations.

Environmental measures, according to Astin (1993), are different aspects of a student's college experience that can impact both cognitive and emotional outcomes. The Theory of Student Involvement categorizes over 160 environmental measures into six general categories: (a) characteristics of institutions; (b) curriculum; (c) faculty; (d) peer groups; (e) residence, major, and financial aid; and (e) student involvement.

As outlined in the results, a student's year in high school is an input characteristic that is impactful in a student's first attempt in a dual credit English course. Likewise, school size and year in school are input characteristics effecting the success in a student's first attempt in a dual credit history course. School size, specifically, was an important factor for success in dual credit history courses. Lavy, Silva, and Weinhardt (2012), found larger peer groups, especially those identified as academically advanced were more likely to have a positive interaction, both emotionally and academically, on peer students within their social groups. While school size is

an input, peer group is an environmental measure directly affected by that input. Finally, the results of this study found the interaction of all three inputs played a significant role in the success of a student's first attempt in a dual credit mathematics course. It is important to remember environmental measures for high school students, while still fall into the same six general categories, will have noticeable differences than those of their full-time college student peers.

College institutions continue to evolve in the manner in which they operate. For example, college institutions have drastically changed over the past 15 years to include an increasingly large number of on-line courses. Often, students are never even required to physically step foot on a college campus, making it easy to not only take courses from anywhere, but it is possible to be enrolled in multiple colleges at the same time in order to take as many courses as desired. In contrast, the manner in which high schools operate remains largely unchanged over the past 15 years. High schools still operate under a brick and mortar design. Students arrive at school early in the morning and remain throughout the day. The differences in the characteristics of each institution is vast, yet there seems to be no meaningful effort to merge the two styles. Supporting different institutional characteristics is not conducive to an optimum learning environment. Student learning styles, active or reflective, go hand in hand with the learning environment that is established. Zhan, Xu, and Ye (2011) found that face-to-face and on-line course environments each contribute differently to each individual style, thus creating different challenges for both the students and the instructor to compensate for in order to produce the optimal learning environment. Institutions from both higher education and high schools will most certainly, need to reconsider learning environment characteristics and work to find

solutions that provides an educational experience that falls in line with each other and accommodates varying learning styles.

Curriculum topics covered in college level dual credit courses pose likely situations covering sensitive topics that may be difficult for young high school students to comprehend and comment on. Literature topics can include subjects of violent, political, or sexual. Controversial and taboo subjects are often the focus of course topics and can lead to in-depth class discussion on such taboo topics. High schools provide a protected environment to reduce exposure to such topics with closely monitored codes of conduct, as where college institutions and classrooms have an open policy that not only allows for open discussion of such topics, but also encourages it. College faculty ideology supports classroom learning and discussion of taboo topics as a responsibility to develop citizens to understand and participate in a democratic society (Evans, Avery, & Pederson, 2000). It is a realistic concern to raise regarding the maturity level of a high school freshman or sophomore and their ability to not only read and comprehend such an assignment, but also be able to participate in a meaningful way in a class discussion covering topics they may feel uncomfortable discussing. The alternative is to lower the rigor and content in order to provide fewer opportunities for potentially controversial topics to be covered. A reduction in content and rigor completely changes the scope of the course, thus no longer making it a true dual credit course. This will obviously create a great concern regarding the necessary skills needed for course objectives mastery.

Faculty for dual credit courses has also proven to be inconsistent providing large gaps in maintaining the same level of instruction for all dual credit courses. While the basic requirements for teaching college level courses, including dual credit courses, remain the same, students in dual credit courses experience a variety of faculty and delivery of course materials.

For example, some courses are taught by an instructor who is a qualified college instructor, but is a full-time high school teacher who is physically located on the high school campus. Some dual credit students actually leave their high school and attend a dual credit course on the college campus, others are instructed via a closed circuit television set with a course proctor located in the high school to assist the class, while others are taught completely on-line where students never meet their instructor face-to-face. Most high school students have not experienced any of these variances in the faculty teaching styles. High school dual credit students perform significantly better in a dual credit classroom taught by full-time high school teachers meeting the qualifications to teach college level course (Hebert, 2001). Typically, high school students have spent their entire educational career in a face-to-face educational setting only to suddenly be faced with a very real opportunity in which a dual credit student could be experiencing all of these teaching styles at the same time can provide confusion as the high school student struggles to adjust to multiple instruction delivery styles.

Peer groups for high school students, especially young high school students entering high school for the first time as a freshman, is an important and critical factor in how students perform academically. As students begin their formative years in high school, grades 9 and 10, peer group are formed and providing support for members of the group. Dual credit students are often not on their high school campus for the entire day or secluded in separate locations in order to either view the closed circuit broadcast of the college level course or to work independently for a class which is conducted primarily on-line. Both of these scenarios remove students from their primary peer group leaving them with reduced opportunities for creating meaningful bonds with their age-level peers. Often, an isolated atmosphere of dual credit courses has been a

contributing factor for students, parents, and school administrators to resist dual credit course enrollment, as peer interaction during the formative high school years is critical (Gertge, 2008).

Residence, major, and financial aid status are environmental measures impact a student's academic performance. Whether a student lives on campus or off campus impacts the ability to seek additional assistance from a teacher or a campus tutor. High school students do not have the option to live on a college campus or have other options pertaining to their college credit. In addition, a student with an undeclared major will be less likely to make the emotional connections that are made early among peers who have chosen a major early and connected with other students who are of the same major. It is critical for college students to be able to connect early with students seeking the same goals. Students receiving financial aid may have more outside responsibilities with families and outside employment. These added responsibilities, depending on the severity, can be detrimental to the academic success of a student. Students living on, or close to campus have increased opportunities to meet and form social supports with similar characteristics such as major of study and socioeconomic status, all of which influence academic success (Schudde, 2011). It is important to note, dual credit students are not eligible to receive federal financial aid. Federal guidelines require any college student to hold a high school diploma in order to receive federal aid, which forces students to have their own financial resources or to rely on state grants (Ziskin, Fischer, Torres, Pellicciotti, & Player-Sanders, 2014). This is obviously, problematic for high school students. The result of this regulation leaves all dual credit students in a situation in which they are solely responsible for securing funding for tuition of the college level dual credit course. High school officials and parents are often struggling to find funding to cover the tuition and often, the very expensive college books.

Student involvement, especially in campus activities, provides an unprecedented level of support for students. Students who are involved in the college campus activities such as student government, intermural sports, interest clubs, and student employment on campus are more likely to seek out assistance from an instructor, be open to attending a tutoring center, or forming study groups. While the same opportunities exist at the high school level, the opportunities to become involved at both campuses is unrealistic. Dual credit students are, for the most part, not physically located on the college campus, proving it quite difficult to become involved in student activities. According to Bergen-Cico and Viscomi (2011), the experience of being physically located on a college campus, having opportunities to engage in meaningful campus events, and building substantial social networks is richly beneficial in students' academic success.

Outcomes

Outcome measures are traditionally categorized in two domains: cognitive and noncognitive. Cognitive outcomes refer to higher order thinking, reasoning, and logic which fit with analyzing educational outcomes such as academic success or grades. Cognitive outcome measures, academic success in a dual credit course, were measured for the purpose of this study.

Outcome measures as they relate to this study would include a student's characteristics after taking a dual credit course. This could be measured in the students' willingness to take additional dual credit courses after completion of their first course. As noted in the results, a student's first attempt in a dual credit mathematics course is reliant on an interaction of all three inputs examined in this study. It is conceivable to question whether students will be successful in subsequent mathematics courses as the dynamics of inputs are subject to change. The same also holds true for subsequent dual credit English courses in which year in high school is likely to change. Outcome measures, attitudes and values, for students are likely to change based on

their previous experiences in dual credit courses. This raises even greater concern for freshmen and sophomores. Pascarella and Terenzini (2016) wrote that grades are the number one indicator of college success. How well high school freshmen and sophomores perform in dual credit courses may speak to how they will view college as a whole. Whereas HB 505 includes freshmen and sophomores in dual credit courses for college, the outcome of the grade has the potential to serve as a motivator or discouragement for future college attendance. The lack of data collected by the state, then, does not only limit the insights of the performance of the bill, but suggests it constrains opportunities to predict college participation and success. Moreover, grades are only one aspect of student outcomes.

Outcome measures are characteristics, knowledge, attitudes, beliefs, and values that exist after a student has graduated. Outcome measures are classified as either Psychological or Behavioral and categorized as Affective or Cognitive (Astin, 1993). For example, academic achievement is classified as Psychological and Cognitive. Astin (1993) identifies high school GPA as the single strongest predictor of college student outcomes (degree attainment) and gender (being female) as being a strong positive predictive factor. House Bill 505, and its lack of meaningful measurable goals, solely focuses on increasing the number of students enrolled in dual credit courses. The lack of emphasis on significant higher academic achievement in the form of grades of A or B, or by examining success of students in grades 9 and 10, or even by examining the progression of students through multiple dual credit courses, provides evidence that lawmakers are not truly concerned about the psychological, behavior, or affective outcome measure development. House Bill 505 is solely cognitive based, meaning the outcome measure is a pass or fail only standard. House Bill 505 falls short in requiring the state to collect data on

the effectiveness of this policy by not mandating more effective outcome measures that would provide more substantive information regarding the effectiveness of the policy.

Public Policy

The lack of data collection for Texas House Bill 505 provides an ideal platform for Fowler's (2013) 6-stage model of policy application. Fowler's model is a process model that focuses on each step and provides opportunities to explore possible opportunities or obstacles as the process proceeds through each step of policy development. House Bill 505 is lacking in information in many areas that may have assisted in developing clear and measurable goals, which would aid in the efficacy of the dual credit program. The stages in Fowler's model involve the following: (a) Issue Definition; (b) Agenda Setting; (c) Policy Formulation; (d) Policy Adoption; (e) Implementation; and (f) Evaluation. However, the policy is lacking data for evaluation. The original development of this study would have provided some insights into the evaluation stage. With a lack of data accompanied with a review of individual policy stages for House Bill 505, it becomes apparent Texas legislators were not concerned about how the bill performed, but with how it provided opportunities for high school freshmen and sophomores. Even so, the lack of data shows the extent to where freshmen and sophomores were involved in dual credit courses statewide. Whatever the case, the lack of data collection for the evaluation stage negates any opportunity to evaluate either the downfall or success experienced in the dual credit program as a result of House Bill 505.

Issue Definition

As Fowler (2013) asserted, issue definition is that process which transforms a problem into an issue which government can address. In terms of House Bill 505, the problem was the shortfall of college enrollment during the final report of Closing the Gaps (2015). House Bill 505

is the result of a policy idea in which legislators were seeking a solution to the problem created when Closing the Gaps failed to meet the goals outlined for the program. As Texas legislators followed Closing the Gaps with a new long-term initiative for higher education, 60x30TX (2016), the target for increased college enrollment focused on dual credit, as this was the area with the largest growth during the Closing the Gaps initiative. Fowler (2013) also described the issue definition as often taking on an attractive discourse assisting in gaining public support, in turn garnering support from both the general public and the policy makers. The dual credit measures put forward in the issue definition of House Bill 505 appear attractive to parents and students wishing to gain a head start on a college career. While it provides an opportunity to begin taking dual credit courses much earlier in high school and lifts restrictions limiting the number of dual credit courses, the results of this study point to an unrealistic vision put forth. High school freshmen and sophomores neither have the flexibility in their schedules, nor do they have a solid academically high school foundation to consider enrolling in college-level courses. Furthermore, freshmen and sophomores typically have less flexibility in their schedules, creating very little options for obtaining course credit should a student fail a dual credit course. It appears high school freshmen and sophomores are not enrolling in dual credit courses at the rate which the policymakers had intended or hoped questioning the validity of the underlying issue definition of House Bill 505.

The discourse associated with House Bill 505 also significantly minimizes the issue of tuition and how students, parents, and/or school districts will assume the additional costs (Lofters, 2015). The pronouncements by supporting legislators claiming reduced tuition and funding given to school districts for dual credit courses (Alvarado, 2016) is misleading. School districts receive the funding for the high school credit class. This is the exact same funding

received, if the courses were not dual credit courses. There is no additional funding gained by offering or supporting dual credit courses on their campuses (Texas Administrative Code 19, Chapter 61, Subchapter II, Section 10.91).

In addition, the college tuition agreements are often individual agreements reached as the result of lengthy discussions and agreements directly between the individual colleges and school districts. There are no provisions in place to allow these cost benefits to extend to all dual credit students across the state. Many small school districts do not have the large enrollments to leverage against colleges and institutions to offer substantial discounts offered to larger school districts. The discourse by legislators is misleading as the equity of tuition fees assessed to dual credit students is far from equal.

Community colleges, universities, and public K-12 school districts are each funded in different manners based on different criteria. According to the Texas Higher Education Coordinating Board (2015), dual credit tuition and associated fees are a local school district decision. Meaning, each district is to decide how to pay for a student's tuition by using school funds, parents, or seeking educational grants. These are all problematic, as it requires a commitment of funds and resources not previously encountered by districts. As parents hear the discourse touting free and reduced tuition, they are looking to the K-12 school districts to take advantage of a reduced college tuition that is more often than not, even in place for their district. With dual credit now the common thread running through higher education and K-12 public education, it is incumbent on legislators to abandon the ambiguous discourse and clearly address the funding inequities for dual credit students and implement a clear structure that allows for equitable funding for all dual credit students in Texas.

House Bill 505, initially, was defined in terms of the number of college dual credit hours a student could take per semester and during one year. The bill lifted previous restrictions limiting a student to six credit hours per semester and 12 semester hours per academic year. The verbiage to allow qualifying high school freshmen and sophomores did not get defined and added to the bill until the amendments were written into the bill several months after the initial writing of the bill. Representative Wayne Smith (R) added this as an amendment on April 9, 2015 (2015).

Agenda Setting

Policy agendas are comprised of issues under serious discussion and have the attention of policymakers. In light of the fact that Closing the Gaps was a 15-year initiative that fell short of its checkpoint goals along the way, increasing college enrollment has been an issue for state policymakers for almost two decades (2015). Fowler (2013) described triggering events can occur which likely move issues to policy agendas. Often these events remain on an agenda for years, as in the case of the 15-year Closing the Gaps initiative which was a triggering event. Policy agendas often cycle through an issue-attention cycle, a phenomenon identified by Fowler (2013) in which an issue resurfaces on policy agendas. Dual credit appears to be on a 15-year cycle as it cycles around with each 15-year higher education initiative implemented by the state.

The agenda of House Bill 505 seems to clearly point at providing an avenue for the long-term college attainment initiative, 60x30TX. House Bill 505 seeks to allow as many students as possible to enroll in college level courses in an effort to raise the overall enrollment headcount.

Policy Formulation

Policy formation consists of developing policy language, which outlines specific details of the policy, including funding resources associated with the policy. This is the process in

which rules guiding the policy are defined (Fowler, 2013). Policy formation is a conservative process, meaning it is specifically designed to be a lengthy and difficult in order to ensure commitment on the part of lawmakers and allow ample time for revisions. The policy process involves legislative proposals as the first steps. House Bill 505 was formulated by being introduced and authored straight into the approval system by four state legislators; Eddie Rodriguez (D), Paul Workman (R), Wayne Smith (R), and Tony Dale (R) and was initially filed in the Texas House in December, 2014. (2015). In light of the fact that House Bill 505 was formulated in December, 2014 just as Closing the Gaps was approaching the ending phase of its 15-year program, makes it clear this bill did not follow normal policy formation timelines. The Texas Higher Education Coordinating Board (2015) clearly points to legislation passed, including House Bill 505, which is linked to the support of 60x30TX. Policymakers were likely prepared to adopt the policy just at 60x30TX was set to take effect.

One of the shortfalls of the policy is that the bill and rule making agency, THECB, did not include key reporting provisions. Although the bill aimed at increasing college participation for the state's higher education master plan, 60x30TX, there were no formalized recording mechanisms in place. Data collection and analyses, results, reporting, information distribution, and accountability standards are not available. Although the bill is tied to the higher education master plan, its formulation did not account for how to assess participation or completion rates.

Policy Adoption

Although policy adoption is often thought of the actual passage of a bill, it is important to understand that a policy proceeds down a long road of adoption. This road includes discussions, hearings, committee meetings, and much more. Through lobbyist, campaign contributions, and even judicial appointments, a policy can be the reason for decisions to move an agenda forward.

There are often trade-offs of one policy in order to move another policy forward in an effort to gain additional support and momentum. Fowler (2013) stated that legislators working with government officials, lobbyist, and professional organizations are three major ways in which policy moves from formulation to adoption. In fact, relationship-building can be the single most important factor when determining how easily or quickly a policy will proceed through adoption.

Both the House and Senate adopted House Bill 505 without a single opposition vote on May 14, 2015. Governor Greg Abbott signed the bill and House Bill 505 became effective as law immediately on May 23, 2015. Since there was no funding tied to the implementation of House Bill 505, funding was not an obstacle for this bill (2015). In addition, House Bill 505 seemingly faced no opposition as it moved through the Texas House and Senate, and ultimately to the Governor's office. The bill was never sent back to committee, giving the impression that all lawmakers gave their approval. In fact, the only revision made to House Bill 505 was in the proposed amendment which actually broaden the scope of House Bill 505 by expanding the program to include high school freshmen and sophomores, and was subsequently added to the final bill.

Implementation

House Bill 505 was implemented primarily through the Texas Higher Education Coordinating Board. Since House Bill 505 relates to high school students taking college level courses, the Texas Education Agency must work collaboratively with the Texas Higher Education Coordinating Board to ensure the seamless implementation of the mandates of this bill. As this policy directly points to the Texas Higher Education Coordinating Board not imposing any rules restricting high school students from enrolling in dual credit students, the Texas Higher Education Coordinating Board revised previous rules which implemented rules

regarding year in school and credit hour limitations. Although the rules were revised, there were no direct, coordinated efforts to communicate this change. The Texas Education Agency was not required to make any procedural or operational changes. Texas public schools governed by the Texas Education Agency are independent of the Texas Higher Education Coordinating Board therefore making the communication regarding House Bill 505 to high schools and to eligible students slow, and in some cases, non-existent. At a micro level, school principals, registrars, and counselors are responsible for the day-to-day implementation and operations concerning House Bill 505. In reality, many school districts are not fully promoting the opportunities for high school freshmen and sophomores to enroll in dual credit courses

The implementation of House Bill 505 appears to be a quantitative process, meaning it is concerned with the number of students enrolling in dual credit courses and the number of dual credit courses taken. Fowler (2013) argued quantitative implementations at the state or federal level run the risk of being modified at the local level in order to fit local needs and circumstances. Even though quantitative implementation at the state level, such as House Bill 505, is difficult to implement without a certain amount of local influence, it is possible with clear directives and guidelines. House Bill 505 does not provide any assistance for implementation, thus leaving local school districts and colleges and universities with experimenting with many different models in an effort to find the correct implementation model that is most effective.

Evaluation

Policy evaluation can take on many forms. There are policy advocates who would argue policy development is a process that provides equity to those affected. They believe the mechanics of collecting ex post facto data are not only unnecessary, but also can be misleading (Moore, 1995). By all appearance, Texas legislators, along with the Texas Higher Education

Coordinating Board, may have the belief that House Bill 505 has provided a degree of equity by allowing all high school students, no matter their classification, to enroll in dual credit coursework. The faulty logic in the decision not to acquire ex post facto data lies in the fact that data acquired for an ex post facto evaluation is not meant to be founded in criticism or only point out negative outcomes. Instead, it can provide opportunities to examine success and failures and offer revisions that may lead to beneficial improvements in the dual credit program.

Policy success does not rest solely on the successful passage of a bill. Policy success rests on the ability to evaluate its effectiveness and the opportunities to revisit revisions that may be necessary (McConnell, 2010). Texas educators, both higher education and K-12, would find great insight from an ex post facto analysis of House Bill 505. Such analysis could be helpful in mapping a student's high school and college graduation plans. In a time when Texas legislators are holding school officials to a high standard of success (Booher-Jennings, 2013), it would be prudent to approach high-stakes dual credit coursework as an opportunity for improvement rather than taking a chance on risking failure due to the lack of meaningful evaluations.

According to Fowler (2013) policy evaluation should include a systematic process for data collection. Additionally, it should be ongoing and not rely only on summative evaluation methods. It is important for measurable indicators to be selected early in the policy development stage, as this assists in keeping the end goals in mind during the policy formulation process.

Consistent data collection and review are imperative to consider future policy revisions. The lack of data being collected by the Texas Higher Education Coordinating Board suggests there has not been any formative evaluation of House Bill 505 since its inception in 2015. According to Stufflebeam (1983), policymakers have an obligation to ensure policies are evaluated for effectiveness to substantiate their merit and worthiness of the attention of

policymakers. Lack of evaluation can be interpreted as a lack of confidence in the policy's effectiveness being brought to light. It can become extremely difficult for policymakers to continue to justify support for a policy for which there are no supporting data or evaluation to validate its effectiveness.

Goals. On the surface, House Bill 505 seems like an obvious benefit for students. However, without following policy initiative protocol, it remains difficult to provide an effective or clear analysis of policy success or failure. There are no clear goals outlined in House Bill 505. The policy simply states the Texas Higher Education Coordinating Board shall not impose any rule that limits the number of dual credit courses a student can take in a semester, while enrolled in high school, or at any grade level. However, goals for House Bill 505 should include: (a) increase the number of students enrolled in dual credit courses as outlined in Texas' higher education master plans; (b) increase the number of overall college credit hours earned by high school graduates; and (c) increase success rates in dual credit course for high school students of each year in high school (freshmen, sophomore, junior, & senior). Setting goals for policy provides clarity and direction to individual and overall objectives, keeping policy moving in an effective direction, rather than becoming stagnant (Jung, 2014).

Data collection instrument. The data collection instrument for obtaining success indicators can be achieved by accessing the reporting tool used by colleges and universities to submit semester and academic calendar year data to the Texas Higher Education Coordinating Board. The instrument is a secure file transfer portal called the Educational Data Center or MOVEit (2017). House Bill 505 specifically states no rule shall be imposed limiting the high school classification for a student to be eligible to enroll in a dual credit course. The lifting of the previous restrictions on high school freshmen and sophomores should indicate a clear

opportunity for tracking data in order to determine the effectiveness of this particular item in House Bill 505. Common college entrance applications primarily used by public colleges and universities has a mechanism already in place to collect the data necessary to measure the suggested outline goals. The Texas Higher Education Coordinating Board would only need to begin collecting the data and disaggregating it for analysis.

Based on this study the information is easily collected at the institutional level, but not collected at the state level by the Texas Higher Education Coordinating Board. The Texas Higher Education Coordinating Board collects data routinely from colleges and universities. The required data collected are outlined by the Texas Higher Education Coordinating Board file transfer guidelines. A myriad of data points are currently collected from colleges and universities, including date of birth. Additional data points needed to be able to determine high school classification is year/semester of first dual credit course, and anticipated graduation date. These additional data points on dual credit students can easily be added to an already existing THECB data file format.

Data analysis. Data should be analyzed both by semester and annually to look for trends in the performance of dual credit students by student characteristics. The Texas Higher Education Coordinating Board provides a webpage dedicated to providing accountability reports to policymakers. This page provides useful information to both policymakers and the public regarding the success of different initiatives (THECB, 2017). House Bill 505 appears to be a companion to the current Texas higher education master plan, 60x30TX, in order to continue the success in dual credit enrollment that was initiated by Closing the Gaps. The Policymakers webpage has 60x30TX progress reports in which dual credit data and analysis would fit nicely. Not only can data be examined for trends, but since HB 505 is tied to 60x30TX, it would be

important to examine data for predictive values to help explain how well the bill is performing and predict how it contributes to the higher education master plan.

Evaluation report. House Bill 505 is aimed at providing support to 60x30TX, a specific initiative geared to increase college enrollment in Texas. Unfortunately, the lack of evaluation on high school students could potentially be a disadvantage to the plan. An evaluation report for House Bill 505 would ideally include data points that are both static in nature and fluid, meaning it will be imperative to see how students succeed academically in any given semester or course, as well as how they perform longitudinally over time and as courses progress through more difficult content. Thus, data analysis needs to include longitudinal variables to assess college participation and college graduation rates of high school freshmen, sophomores, juniors, and seniors.

A report should also discuss the number of credit hours students are taking each semester and throughout the entire progress of high school. House Bill 505 specifically keeps the Texas Higher Education Coordinating Board from imposing any rule that restricts the number of courses a student can take during any given semester or during a student's entire high school career. An effective evaluation report would include examining any impact made to on-time high school graduation. Most importantly, an evaluation should monitor the impact of dual credit on students in grades 9 and 10. This addition to the policy appears to be the most invasive and possibly have the most impact on student success and the ability to continue towards the path to on-time high school graduation. The longitudinal study will provide import insight to patterns and success rates over time, which may prove helpful in providing support for House Bill 505, or re-defining parameters and establishing revised goals. Daun-Barnett (2013) found that

longitudinal studies are critical in recognizing effective school structures and educational frameworks that provide the best results.

Report recipients. The lack of policy evaluation typically revolves around politics and power. Non-evaluated policies, or policies evaluated with a large degree of mediocrity, typically encompass a political dimension revolving around the protection of political careers and a critical assessment of the policies produced under their tenure (Rallis, 2001). As politics in America continues to be influenced by wealthy donors and philanthropists, often, large donations are made in an effort to sway policy makers based on social views, rather than based on data research supporting a cause (Rogers, 2015). While it is conceivable to implement a policy without an evaluation component, it is unrealistic to expect effective or meaningful change as a result of the policy without an accurate evaluation of the policy. Policymakers should unequivocally attach an evaluation component to House Bill 505, and any other future policies which effect dual credit students, in order to fully understand the impact of the policy and make informed decisions about revisions that may be necessary.

Texas colleges and college enrollment seem to be the beneficiary of House Bill 505. Colleges have the ability to analyze their data that are currently being collected. It would be prudent for colleges and universities to examine success rates of dual credit students in high schools in which they are serving. Drinka, Voge, and Yen (2005) found internal processes for conducting self-analysis within a college will provide increased student learning and improved faculty effectiveness within the classroom. The internal data will be insightful to analyzing internal successes and providing valuable information that would be readily available to assist state lawmakers in future policies.

Texas high schools and school administrators should be keeping vigilant records regarding the success of their dual credit students. Ideally, the Texas Education Agency would be collecting this data from all high schools throughout the state in an effort to analyze state trends in high school students enrolled in dual credit courses. They could coordinate with the Texas Higher Education Coordinating Board for analysis and reporting. High school administrators and counselors should remain vigilant in assisting students as they plan courses and schedules that may include dual credit courses. While dual credit courses target high school students in an effort to boost college enrollment, Tobolowsky and Allen (2016) pointed to many challenges that impact student success including lack of adequate student preparedness, no uniform funding resources, and stagnant college degree attainment. In the end, Texas high school administrators have a responsibility to ensure that students enrolled in the high schools for which they are charged with the daily operations and should make decisions and approvals for course enrollment that is beneficial for the students they serve.

Implications

House Bill 505 states that the Texas Higher Education Coordinating Board will not limit who in high school can take dual credit courses or limit the number of courses they can take. However, the bill does not stipulate an accountability system for either education systems or the state. This research, then, sought to examine how well HB 505 performs with regard to freshmen, sophomores', juniors', and seniors' success in dual credit courses. The results revealed two major concerns. First, freshman and sophomore data are not available from the state, even though the THECB is charged with implementing the bill. Second, results are mixed with regard to juniors and seniors, which raises concern that it is even more critical to have data

on freshman and sophomores in order to gain a better perspective of the effectiveness of the bill. Implications are related to those two major concerns.

Availability of Data

House Bill 505 has three provisions to it. The Texas Higher Education Board may: (a) not limit how many dual credit courses or hours a high school student may take while in high school; (b) not limit the number of credits or courses a high school student takes in a semester or year; and (c) not limit the high school students' grade level for taking dual credit courses.

As such, the first implication is that a student could take all dual credit courses he or she can. From the freshman year forward, a student could find any college or university that fits dual credit and high school requirements and work toward a degree. There are no provisions to restrict where a student obtains credits or what delivery platform, face-to-face, online, or blended. The lack of data indicates difficulty in tracking student success at both the high school and college levels. Both high schools and colleges will be held accountable for retention and graduation rates. The problem is also larger than simple retention and graduation rates. State funding for academics and operations are tied to completion data. Accreditation standards must be maintained. Transfer credit must follow strict policy. Thus, unlimited amounts of dual credit course work per high school career has the potential to create additional problems as it conflicts with other policies.

The second implication relates to timing. Essentially, with no limit as to how many dual credit courses a student takes during a semester, including summer, potentially he or she could graduate from high school and college in three years; high school students could also be college graduates at the age of 17. This would be the exception not the rule. Since dual credit courses are tied to 60x30TX, taking courses from colleges may not help Texas colleges. Potentially,

students could take online courses from other states each semester. Given transfer policies from those institutions, Texas high school students could have degrees from out-of-state institutions. Without collecting data, it is uncertain how the bill actually impacts Texas education semester to semester. A semester to semester analysis would provide lawmakers and stakeholders a better understanding of how the bill impacts state goals.

The third implication relates to not limiting the level of high school student eligibility for dual credit courses. This indicates the state's priorities are with academic production versus student development. Through 60x30TX the state is seeking to produce more college graduates to enter the workforce. However, a college degree is not the sole criteria for an effective work force. Maturity, experience, and socialization are key components of an educated work force (Benzinger, 2016). Whereas the potential for more college educated Texas citizens may be eligible for the work force, the bill falls short of whether they are prepared for the work force. Though the metrics of 60x30TX may be achieved, the actual contribution to the work force may not, at least initially. With the lack of data the state may find it difficult both to justify how HB 505 contributes to the higher education master plan, 60x30TX, and how it has contributed to a prepared workforce.

Mixed Results

The fourth implication concerns inputs. For example, school size and classification all played various roles. House Bill 505 implied that only classification would be important for participation. However, the data set for this study showed a startling lack of participation at the level the bill intended, which not only affected the study, but the effectiveness of the bill thus far, as well as how it relates to the higher education master plan. There are several more inputs to consider for students to participate in dual credit courses than state mandated high school student

classification. Classification alone did not provide the basis for more freshmen and sophomores participation in dual credit courses toward a college degree.

The fifth implication reveals, at the current stage of policy implementation of House Bill 505, a lack of progress toward college credit. The policy issue stage revealed an emphasis from stakeholders that an earlier high school start to college credit would be an advantage. This assumes freshmen and sophomores would participate. However, in the policy issue stage, there was no evidence found to where the policy was developed based on some sort of market analysis, town hall meetings, public discussions, integration with high school curricular demands, or other avenues of data gathering. Ancillary to the lack of progress toward college participation is the economic impact. In the issue definition stage, legislators highlighted the cost savings of a college degree to students/parents. However, the lack of participation indicates the cost savings is not an appeal at the early stages of high school freshmen and sophomore levels, yet. Moreover, there may be a cost savings to student/parents but there may be additional costs to schools and colleges. It appears the bill was developed with an “if you build it, they will come” mentality. This may still occur as there is still 13 years remaining in the 60x30TX master plan.

The sixth implication revolves around resources. The study showed larger schools performed better than smaller ones, whereas the literature indicates smaller schools perform better. This may be a matter of resources. Although legislators represent poor and rich as well as rural and urban areas of the state, it does not necessarily mean there is grasp of the resources it takes to deliver dual credit courses. Most dual credit programs only offer the basic courses that would meet college core requirements. The resources simply are not available to offer more. Offering more courses requires a significant investment in space, faculty, salaries, and support

staff at both high schools and colleges. On the one hand, it may appear to cost students/families less money toward a college degree for those who participate in dual credit programs. On the other hand, the cost of a college education may rise, significantly, for those who do not participate in dual credit programs because high schools/colleges will have to fund the programs somehow.

Pragmatic Concerns

The seventh implication involves advising issues. Advising students in dual credit programs is problematic due to college advisors not being on the high school campuses. A lack of real or consistent access to college advisors, students are more likely to self-advise, thus taking courses not required for their individual degree/certificate plans. In addition, with no previous exposure to college experiences, students are at risk to not fully understand the full array of advising services available to students. Advising is a crucial component for the continued advancement of students through college. Students without adequate advising are at the highest risk of dropping out. Community colleges struggle with student attrition at the beginning of a student's enrollment in college. Hatch and Garcia (2017) found students are at a high risk within the first semester of college to drop a college course. Even more alarming is the attrition rate of students between enrollment and the first day of class. The high attrition rate for students who have full access to college advisors is problematic. Dual credit students without full access to college advisors may be at an even higher risk of attrition. College advisors already struggle to understand how to manage advising resources without adding the demands of additional students all of which are located at varying high schools with no real systematic plan in place for advising.

The eighth implication relates to academic progress toward a degree. Dual credit students have a different set of hurdles to jump than other students in order to progress toward college graduation on time. The state of Texas higher education master plan, 60x30TX, specifically calls for students to be on a path to a college degree or certificate. Dual credit courses are primarily core subject courses including English, history, and mathematics. Many college certificates consist only of 15 or 30 college credit hours that do not include many, if any, other subject matter that lead to a certificate or degree. By enrolling in the only dual credit courses available to high school students, students are jeopardizing their ability to change their course of study and still continue on a path toward an on-time college graduation. A student's early selection of college major is one of the strongest contributing factors to on-time graduation (Yu & Fu, 2017). The current structure of dual credit is simply to provide students with basic core subject courses in hopes they will apply to an associate's or bachelor's degree as they transition into college after high school graduation. In actuality, this structure does not fully support the goals of 60x30TX with regards to certificate attainment.

The results of the study showed a severe lack of participation of freshmen and sophomores in dual credit courses. This leads to questions of socialization as a ninth implication. Socialization among college peers is an important aspect for emotional success in college, as well as academic success. High school students enrolled in dual credit courses are restricted to college peer socialization only to other high school students enrolled in their dual credit course also. Even this scenario is not always optimal given the fact that some dual credit courses are conducted on-line or even via closed circuit television, both of which limit even further socialization opportunities among college student peers. In actuality, the setting for dual credit courses can be more isolating for students almost creating barriers for socialization.

Socialization skills are developed early in college and the college setting provides for contextualization of situations allowing students to learn appropriate cues and expected behaviors in professional and social settings (Chen & Yao, 2015). Students enrolled in dual credit courses lose the opportunity to fully socialize with peers of their own age and point in college during early college entry.

Even if college socialization issues are resolved, there is concern pertaining to maturity and developmental interaction. For example, freshmen and sophomores interacting with juniors and seniors at the same college level raises concern about the maturity needed to interact. Sharma (2012) wrote a transition from high school to college is complex. Based on research from Pascarella and Terinzini, Sharma added it is a culture shock and a psychological relearning of one's environment. Much like a college campus, involvement in dual credit courses encompass collegiate outcomes, interaction with more mature students, and reliance on adult expectations. Whether high school freshmen and sophomores are developmentally ready for the adjustment remains a question. If research on college students is an indication, the answer is no. Sharma's study was consistent with previous research in the area and found that freshmen had psychosocial adjustment problems more than those who were seniors. They also lacked social adaptability. The ability to adapt is based on higher levels of maturity. The possibility is present that freshmen, typically 14 years old, and sophomores, typically 15 years old, are not developmentally mature enough for college courses and interaction with more mature college peers. As such, House Bill 505 may be encouraging more drop-out rates than completion rates needed to meet the goals of 60x30TX.

An additional concern is the apparent push by legislators to provide an avenue to allow any high school student to take as many dual credit courses as desired raises significant questions

concerning the rigor of the dual credit course and the true compatibility of a college-level course. Credentialing, according to Collins (2002), is the practice of creating either unsubstantiated or unwarranted educational credentials in an effort to self-promote or enhance higher education or post-schooling training, as an effort to lead to more employment opportunities. Arguments have suggested dual credit is simply contributing to the practice of credentialism permeating the education system and contributing to the devaluing of a bachelor's degree (Howley, Howley, Howley, & Duncan, 2013). Credentialing essentially devalues the education. Another contributing factor to the devaluing of dual credit coursework is the lack of continuity across colleges and universities with local high schools. Higher education personnel report their involvement in dual credit courses seem to fluctuate with a high school's needs and lack of a common structure needed to ensure efficacy throughout participating high schools (Barnett, Philippeaux-Pierre, & Stenbridge, 2010). Interestingly, 60x30TX does not only call specifically for Texans to seek a college degree, but also calls for the completion of a college certificate, if a degree is not being pursued. A college certificate is simply a credential for completing as little as a mere 15 college semester hours, or five courses, fully supporting the idea of credentialing creeping its way slowly into the educational systems, both K-12 and higher education.

A final concern is the data evaluation and evidence of lack of participation for high school freshmen and sophomores indicates an alarming reality that House Bill 505 is actually contributing to the educational gap between higher and lower socioeconomic populations. The failure on the part of policy makers to address the lack of tuition funding for students wishing to enroll in dual credit courses leaves student, parent, and school districts struggling to find resources to pay college tuition costs. Contributing to the inequity of the dual credit program is the arbitrary reduction of tuition by college for larger high schools with larger student populations. This practice leaves students in rural districts to pay higher costs for the exact same

course as their peers from larger schools, thus contributing again to the widening educational gap. It is also unfortunate that state policy makers did not consider the fact that federal Pell Grant college tuition assistance is currently not available to high school students. Federal guidelines stipulate a student must be a high school graduate in order to receive federal financial aid for college tuition. Again, this reiterates the need for a comprehensive dual credit program that is uniform in course offering, course structure, and most of all in course tuition and tuition funding availability for all dual credit students.

Recommendations for Future Research

The results of the study and the policy analysis provides a framework for future research. First, data need to be collected from high school freshmen and sophomores. The data may be available through each college and university in the state of Texas. However, each college and university may track students differently, therefore a benchmark may need to be developed in order to classify students appropriately as freshmen, sophomores, juniors, and seniors. This may become more and more difficult as time passes since the number of credits each student can take per semester and year are not limited. The potential is for a 14-year-old, who normally would be a freshman, could be classified as a junior. Researchers would need to determine if age is a critical criteria or classification or a combination of both. Whatever the classification system, it should be studied in relation to Texas' higher education master plan. In this case, it is 60x30TX.

A second recommendation is linked to students who participate in dual credit courses and their college graduation rates. A longitudinal study should examine when students enter dual credit courses, what courses they take, and how it affects their college career. Since House Bill 505 is linked to the Texas higher education master plan, data need to show how many dual credit students contribute to the goals of the plan, from credits per term/year, from credits per high

school career, from level of classification, as well as from gender, ethnicity, type of courses, and once in college, their major.

Third, since House Bill 505 is tied to 60x30TX for students to enter the work force, research needs to be conducted on the types of profession students enter. College graduates entering the work force at various levels of economic impact can provide a detailed perspective of the role the bill has in the importance of college completion for students at earlier ages than traditional age ranges. The study would need to be expanded to include not just the types of work, but the length of time in those position and the time it took to get to higher paying positions in the professions. This can include a comparison of college graduates who were not dual credit students to ascertain if one track was more beneficial than another to achieve higher levels of economic development contributions.

Fourth, there is a concern about more than just the academic development of students. Research shows that age, as well as social interaction with ones' peers, plays an important role in the development of a person. The need to fit in socially is a strong factor among multiple factors affecting academic success including college adjustment, on-time graduation, successful employment in a student's field of study (Chen & Yao, 2015). Future research should look at the maturity development of younger, college graduates in comparison to traditional aged graduates to help understand their preparation for the work force. Although students may be academically certified to enter the work force, students' actual maturity development may lag behind their classroom preparedness.

Fifth, as dual credit is most likely a permanent fixture on the educational scene, it is imperative to examine the construct of the program holistically. Currently, the model is not conducive to either the higher education model or the K-12 model. Dual credit students would

benefit from uniformity in areas such as course delivery, faculty credentials, and tuition fee structure. In order to provide the most effective learning atmosphere, extensive research is needed to examine best practices for student engagement in the dual credit environment. Woodward (2017) found educational models focused on student-centered initiatives with commonly trained faculty provided an excellent foundation for student success for students in their first semester of college. Additional research into creating common protocols for dual credit students is imperative to create a successful program and equity for dual credit students throughout the state of Texas.

Sixth, tuition fee structure is a tremendous concern for dual credit students. Additional research should be conducted to explore how different high schools are assessed tuition fees in different ways. Currently, dual credits students from different high schools can be participating in the exact same dual credit course and be paying completely different fees. This creates an inequity that inhibits the participation in the dual credit program. While 60x30TX opens the doors for high schools to partner with the college or university of their choice to host their dual credit courses, that partnership does not include a provision for tuition. High schools are left to try to negotiate a reduced cost for their students, as federal student aid is not available to dual credit students. Larger districts are much more successful at this tactic as they bring more paying students to the college. Smaller districts are typically, left out of such agreements and made to either procure other funding or pay the full tuition fee. Districts are turning to foundations for grants and donations to provide tuition scholarships for dual credit students. College policies for assessing dual credit tuition is creating inequities for students of low socioeconomic status (Taylor, 2015). Further research to analyze the systematic differences in

dual credit tuition would provide policymakers with some direction in moving to a more equitable system.

Seventh, legislators presented House Bill 505 as a cost savings for students' college education. Research should examine this issue from two perspectives. Comparisons between dual credit and non-dual credit students can be investigated. College costs are not just those incurred by students. The state has an investment as well. Therefore, comparisons between dual credit and non-dual credit course delivery can be studied. This would include costs to deliver courses on high school and college campuses. Dual credit courses are offered on a number of types of campuses in different state regions. Cost differentials should be examined.

Eighth, it is important to understand how other variables relate to dual credit success. Ethnicity, socio-economic background, access, and first-time-in-college variables continue to be a concern among researchers for students in underrepresented populations. Although House Bill 505 encourages college participation at a younger age than previous policy, there are concerns about whether it will be inclusive of all populations.

Summary

House Bill 505 lifted restrictions on who in high school could participate in dual credit college courses. Whereas previous to HB 505, only high school juniors and seniors were allowed to take dual credit college courses, the bill allows for freshmen and sophomores. This study began to look at the academic success rate of freshmen, sophomores, juniors, and seniors based on the provisions of HB 505. However, data were neither available in the data set nor by the state. This indicated a shortcoming in the policy process. The state mandates the eligibility of high school freshmen, sophomores, juniors, and seniors, but does not require data to be collected or reported. The concern is advanced because HB 505 is tied to the state's higher

education master plan, 60x30TX, to increase college graduates with a college certificate or degree.

Both statistical analyses and policy evaluation were completed. This was done to provide a more in depth understanding of how well high school freshmen, sophomores, juniors, and seniors performed academically according to House Bill 505. Statistical analyses were completed with juniors and seniors. The mixed results showed that Inputs-Outputs-Outcomes (Astin, 1993) plays a large role in academic success. According to policy evaluation, the state of Texas falls short of connecting academic results to HB 505, as well as 60x30TX. Therefore, assessing student outcomes according to the provisions of the bill needs further investigation.

The state of Texas wants a more educated workforce, both in terms of degrees/certificates and numbers. This is evident according to House Bill 505, 60x30TX, and the linking of the two. However, the outcome of a more educated workforce is difficult to assess given the current lack of direction by state officials. If Texas is going to be successful, its approach to policy must be better developed.

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Appendix A

H.B. No. 505

AN ACT

relating to a prohibition of limitations on the number of dual credit courses or hours in which a public high school student may enroll.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

SECTION 1. Section 28.009(b), Education Code, is amended to read as follows:

(b) The agency shall coordinate with the Texas Higher Education Coordinating Board as necessary in administering this section. The commissioner may adopt rules as necessary concerning the duties under this section of a school district. The Texas Higher Education Coordinating Board may adopt rules as necessary concerning the duties under this section of a public institution of higher education. A rule may not limit:

(1) the number of dual credit courses or hours in which a student may enroll while in high school;

(2) the number of dual credit courses or hours in which a student may enroll each semester or academic year; or

(3) the grade levels at which a high school student may be eligible to enroll in a dual credit course.

SECTION 2. Section 130.008(f), Education Code, is repealed.

SECTION 3. This Act applies beginning with the 2015-2016 school year.

SECTION 4. This Act takes effect immediately if it receives a vote of two-thirds of all the members elected to each house, as provided by Section 39, Article III, Texas Constitution. If this

Act does not receive the vote necessary for immediate effect, this Act takes effect September 1, 2015.

Appendix B



OFFICE OF RESEARCH COMPLIANCE
Division of Research, Commercialization and Outreach

6300 OCEAN DRIVE, UNIT 5844
CORPUS CHRISTI, TEXAS 78412
O 361.825.2497 • F 361.825.2755

Human Subjects Protection Program	Institutional Review Board
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APPROVAL DATE: July 12, 2017
TO: Michelle Kimitchek
CC: Dr. Randall Bowden
FROM: Office of Research Compliance
Institutional Review Board
SUBJECT: Notification of Exemption

Protocol Number: HSRP #95-17
Title: The Relationship between Student Characteristics and the Successful Completion of Dual Credit Courses in English, History, and Mathematics
Review Category: Qualifies for Exemption

Approval determination was based on the following Code of Federal Regulations:

Eligible for Exemption (45 CFR 46.101)

Criteria for exemption has been met (45 CFR 46.101) - The criteria for exemption listed in 45 CFR 46.101 have been met (or if previously met, have not changed).

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Provisions:

Comments: The TAMUCC Human Subjects Protections Program has implemented a post-approval monitoring program. All protocols are subject to selection for post-approval monitoring.

This research project has been granted the above exemption. As principal investigator, you assume the following responsibilities:

1. **Informed Consent:** Information must be presented to enable persons to voluntarily decide whether or not to participate in the research project unless otherwise waived.
2. **Amendments:** Changes to the protocol must be requested by submitting an Amendment Application to the Research Compliance Office for review. The Amendment must be approved before being implemented.
3. **Completion Report:** Upon completion of the research project (including data analysis and final written papers), a Completion Report must be submitted to the Research Compliance Office.
4. **Records Retention:** All research related records must be retained for three years beyond the completion date of the study in a secure location. At a minimum these documents include: the research protocol, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to participants, all correspondence to or from the IRB or Office of Research Compliance, and any other pertinent documents.
5. **Adverse Events:** Adverse events must be reported to the Research Compliance Office immediately.
6. **Post-approval monitoring:** Requested materials for post-approval monitoring must be provided by dates requested.

Appendix C

From: Missy Klmitchek
Sent: Thursday, July 20, 2017 3:41 PM
To: REHAK, Patricia <Patricia.Rehak@victoriacollege.edu>
Subject: Re: Data for Dissertation

Hi Patricia -

Thank you so much for the follow up email. Next will be perfect for my timeline. I am hoping to to have data by the end of July and spend August analyzing and writing results.

It was so good to speak with you today! I will make a point to come by and visit with you as soon as I have the results and share it with you!

Thanks again,
Missy

From: REHAK, Patricia <Patricia.Rehak@victoriacollege.edu>
Sent: Thursday, July 20, 2017 3:31:04 PM
To: Missy Klmitchek
Subject: RE: Data for Dissertation

Hi Missy,

Just a quick follow-up for your records. My office will work to get this for you early next week. We have been out of the office this week and are closed on Fridays in the summer. It shouldn't be a problem to get it to you early next week.

Have a wonderful weekend!

Patricia

From: Missy Klmitchek [<mailto:mklmitchek@industrialisd.org>]
Sent: Tuesday, July 18, 2017 1:53 PM
To: REHAK, Patricia <Patricia.Rehak@victoriacollege.edu>; HINDS, David <David.Hinds@victoriacollege.edu>
Cc: Missy Klmitchek <mklmitchek@industrialisd.org>
Subject: FW: Data for Dissertation

Hi Patricia –

Attached is the IRB Exemption/Approval that I have been waiting on to finalize my request for the data outlined in my earlier email. I had previously sent the contact info for my Dissertation Chair, Dr. Randall Bowden, and a copy of my proposal which outlined the Scope and Purpose of the project and the steps for confidentiality.

I am asking for one change in the requested data. Instead of date of birth, which according to my notes you were going to calculate to an age for me, I would instead like to collect the "Projected high school graduation date" (this is information that is collected at the time a student submits an application and is a field in Banner). The reason for the change is that I am actually focusing on the House Bill that states students entering high school as a freshman can now take dual credit courses as opposed to the previous statute requiring them to be at least a Junior. I am going to follow the wording in the law and focus on high school classification rather than age.

As a re-cap: I am asking for:

- Student ID (I don't need the actual ID – can be a randomly assigned number)
- Projected date of high school graduation
- School Size (6A, 5A, etc.) I had originally asked for school name and I would convert it but I believe you and Dr. Hinds agreed you would do the conversion.
- Gender
- Course Taken – Engl 1301, Math 1314, Hist 1301 (taken as just one course in a semester or in a combination of two or more)
- Grade – A, B, C, D, F, or W
- Semester/Yr Enrolled – Fall or Spring (Fa15, Sp16, Fa16, or Sp17)

Please let me know if you have any questions. I would love to have the data in an Excel spreadsheet in order to upload to my SPSS program more easily.

Thanks
Missy Klmitchek

Missy Klmitchek, MAIS
Curriculum Director
Industrial ISD
mklmitchek@iisd1.org
www.iisd1.org
361-284-3226 x1183

A comfort zone is a great place to be, but nothing ever grows there!

From: Missy Klmitchek
Sent: Monday, May 15, 2017 2:51 PM
To: 'HINDS, David' <David.Hinds@victoriacollege.edu>
Cc: REHAK, Patricia <Patricia.Rehak@victoriacollege.edu>
Subject: RE: Data for Dissertation

Hello –

Below are my comments to Dr. Hind's responses to Patricia.

Attached is the specific scope of the project, principal researcher information, and the confidentiality of data information you requested.

Thanks again,
Missy

Missy Klmitchek, MAIS
Curriculum Director
Industrial ISD
mklmitchek@iisd1.org

mklmitchek@iisd1.org
www.iisd1.org
361-284-3226 x1183

A comfort zone is a great place to be, but nothing ever grows there!

From: HINDS, David [<mailto:David.Hinds@victoriacollege.edu>]
Sent: Saturday, May 13, 2017 6:04 AM
To: Missy Klmitchek <mklmitchek@iisd1.org>
Cc: REHAK, Patricia <Patricia.Rehak@victoriacollege.edu>
Subject: RE: Data for Dissertation

Of course!

Looking forward to seeing your results.

From: Missy Klmitchek [<mailto:mklmitchek@iisd1.org>]
Sent: Friday, May 12, 2017 5:39 PM
To: HINDS, David <David.Hinds@victoriacollege.edu>
Cc: REHAK, Patricia <Patricia.Rehak@victoriacollege.edu>
Subject: RE: Data for Dissertation

Thank you so much.

I can definitely provide all of the information you have asked for. I will be submitting my application for IRB approval next week. I will forward that to Patricia as soon as I receive it.

I will certainly work with Patricia moving forward. I just wanted to be sure you were okay with the framework of the study and that we can to acquire the data.

I think the results will be quite interesting and may even provide supporting data to help support dual enrollment for Victoria College.

Again, thank you for working with me. I will work with Patricia to get her the requested information.

Missy Klimitchek

From: HINDS, David [David.Hinds@victoriacollege.edu]
Sent: Friday, May 12, 2017 4:46 PM
To: Missy Klimitchek
Subject: RE: Data for Dissertation

OK, I have a recommendation from Patricia and these is the information we would need:

Scope and purpose of project:

Please describe the scope and purpose of project.

Principal Researcher and affiliated University/Advisor/Researcher

Please include the names of the principal research and affiliated University/Advisor/Researcher and contact information.

Confidentiality of Data:

Please describe the measures that will be used to protect the privacy of subjects and Victoria College. Also address measures that will be used to maintain the confidentiality of data, including plans for publication, disposition or destruction of data, etc. Additionally describe how data from small populations will be masked (if they exist). For example, if the total population of 14 or 15 year olds from a school is less than 10.

IRB Approval:

Has IRB approval been obtained from the sponsoring university? Please include a copy of approval or a letter of recommendation from the affiliated University/Advisor/Researcher.

In addition, I would suggest that we "scrub" the data to remove identifying characteristics. Here is what I would suggest:

Student ID – All digits except the last two will be masked (remove student IDs and simply assign random ID number) – This will be perfect. They can even be numbered 1, 2, 3, 4, etc.

Date of Birth – in order to determine age (calculate age and provide age in years rather than DOB) – This is fine too. I am looking for their age at the time they began their FIRST dual credit student. For example: If they took their first dual credit course in the Spring of 2016, This will be converted to year in high school.

Name of High School – in order to determine school size (6A, 5A, etc. I will convert the high school to their corresponding UIL school size) (provide school size rather than providing the school name) We can work together on this. If you don't know their UIL school

size, I can help convert them prior to giving me the data.

Gender (provide)

Course Taken – Engl 1301, Math 1314, Hist 1301 (taken as just one course in a semester or in a combination of two or more) (provide)

Grade – A, B, C, D, F, or W (provide)

Semester/Yr Enrolled – Fall or Spring (Fa15, Sp16, Fa16, or Sp17) (provide)

I think that would provide everything you need and protect the data further.

If this sounds like it would work just communicate directly with Patricia on the request.

Thoughts?

Thanks.

David

From: Missy Klimitchek [mailto:mklimithek@iisd1.org]
Sent: Friday, May 12, 2017 3:29 PM
To: HINDS, David <David.Hinds@victoriacollege.edu>
Subject: Re: Data for Dissertation

Hi

Thank you so much! I am hoping to schedule my Dissertation proposal for June 9th!

I'm sure you are knee deep in graduation this week!

Missy

Sent from my LG V20, an AT&T 4G LTE smartphone

----- Original message-----
From: HINDS, David
Date: Fri, May 12, 2017 3:23 PM
To: Missy Klimitchek;
Cc: REHAK, Patricia;
Subject: RE: Data for Dissertation

Hi Missy,

I'm glad you called Mary Ann to ask where this was, because frankly, it got buried! I'm so sorry I did not reply to you.

I have discussed with Patricia and she will have a recommendation to me by the end of today.

I'm glad to hear things are good on your end. They are certainly good here ☺.

David

From: Missy Klimitchek [<mailto:mklimitck@iisd1.org>]
Sent: Tuesday, May 09, 2017 3:57 PM
To: HINDS, David <David.Hinds@victoriacollege.edu>
Cc: REHAK, Patricia <Patricia.Rehak@victoriacollege.edu>
Subject: FW: Data for Dissertation

Hello Dr. Hinds!

I hope this email finds you doing well! I hope things at Victoria College are going well! I am sure you have had a very busy week of ceremonies of completion, pinnings, and graduation! I have had a very busy year at my new position as Curriculum Director at Industrial ISD. I absolutely love my job, but I sure do miss my friends and colleagues from the college! It is a tough adjustment to just stop seeing those you are close to after you have worked somewhere for such a long time! (Of course, you know this after your move to Victoria!)

As you know, I started a doctorate degree at Texas A&M Corpus Christi about 3 years ago. I am currently working on my dissertation. I hope to propose in early June and defend in September or October. The plan is to graduate in December! ☺ I am writing you to obtain permission to obtain data from Victoria College for my dissertation. Below is the framework for my study:

In 2015 the Texas legislature mandated that all colleges provide dual credit courses for ALL qualifying high school students who were college ready. This lowered the minimum required high school grade level for dual credit students from Juniors (typically age 16) to Freshmen (typically age 14). I am proposing a study to look at dual credit student characteristics at Victoria College from the 2015-2016 academic year and the 2016-2017 academic year to conduct a quantitative assessment of House Bill 505.

I will be examining school size, high school classification, and gender.

I will be looking at first time dual credit students in the following courses: Engl 1301, Math 1314, Hist 1301. The following data will be required:

Student ID – All digits except the last two will be masked
Date of Birth – in order to determine age
Name of High School – in order to determine school size (6A, 5A, etc. I will convert the high school to their corresponding UIL school size)
Gender
Course Taken – Engl 1301, Math 1314, Hist 1301 (taken as just one course in a semester or in a combination of two or more)
Grade – A, B, C, D, F, or W
Semester/Yr Enrolled – Fall or Spring (Fa15, Sp16, Fa16, or Sp17)

I am excited to see the results of this study, and I will be more than happy to share my results with you as to give you a better idea on how dual credit students at Victoria College are performing in their first attempt in a dual credit course.

I would be more than happy to answer any questions you may have!

Thanks so much!
Missy

Missy Klimitchek, MAIS
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