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Brian J. Modarelli
University of South Carolina - Columbia

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INTENSIVE DUAL ENROLLMENT: EARLY CREDITS OR EMPTY PROMISES

by

Brian J. Modarelli

Bachelor of Science
Baptist University of America, 1986

Master of Science
Florida State University, 1988

Educational Specialist
Augusta State University, 1996

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Submitted in Partial Fulfillment of the Requirements

For the Degree of Doctor of Philosophy in

Educational Administration

College of Education

University of South Carolina

2014

Accepted by:

Peter Moyi, Major Professor

Zack Kelehear, Committee Member

Ed Cox, Committee Member

Christian Anderson, Committee Member

Lacy Ford, Vice Provost and Dean of Graduate Studies

DEDICATION

With boundless love and genuine gratitude for their patience and understanding, this dissertation is dedicated to my wife, Tara Modarelli, and to our four wonderful children. This work is also dedicated to my parents, James and June Modarelli, who taught their children the pricelessness of learning and made so many personal sacrifices to provide for our education.

ABSTRACT

American high school students are afforded a wide array of opportunities to earn college credits. Industrious secondary students are enrolling in early credit options in steadily growing numbers, and are expecting the benefit of entering the university of their choice with several college credits already completed. However, an unmistakable lack of standardization and predictability exists regarding the transferability of college credits earned by secondary students. The purpose of this research is to determine the relationship between the selectivity level of a university and that university's willingness to accept either an associate degree or the transfer credits from an early credit provider – particularly that of intensive dual enrollment programs. Intensive Dual Enrollment programs are designed to allow high school students to simultaneously complete their first two years of college and their last two years of high school.

The results of the study provide evidence that more selective colleges are less apt to recognize an associate degree earned through an IDE program. The study also showed that higher levels of college selectivity correlate with lower transfer rates of dual credits. The detail of these results can prove instructive for school leaders who are interested in growing a dual enrollment platform at their school. The outcomes can also be informative for school guidance counselors, parents of high school students and the students themselves, as they map academic pathways from high school through college

completion. Finally, the research can prove quite helpful for policymakers as they

consider ways to increase college accessibility and greatly decrease college costs.

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CHAPTER 1

INTRODUCTION

I listened with great interest to the story about traffic on a particular Fort Lauderdale stretch of Interstate 595, backing up for nearly two miles as a result of an academic open house. As a headmaster at a private school, I could only wish that the automotive bottleneck were descriptive of my school's open house traffic. Instead, the Davie, Florida, policeman was describing the congestion he annually witnesses when The College Academy at Broward College holds informational meetings for prospective parents. This hybrid program allows high school students to earn associate degrees by the time they finish high school. I have visions of creating this type of program, but I have a number of nagging questions. If my school were to launch such a program, would an associate degree from a secondary/postsecondary hybrid program achieve recognition from selective universities? Does the level of selectivity of a university affect the number of dual credits that can be transferred to the institution? Would all the college credits earned by students in the program transfer to selective universities? I was concerned that my school would develop a program to deliver high numbers of college credits to students, only to learn that universities failed to accept the credits.

American high school students are afforded a wide array of opportunities to earn college credits. Industrious secondary students are enrolling in early credit options in steadily growing numbers, and are expecting the benefit of entering the university of their choice with several college credits already completed. However, an unmistakable lack of

standardization and predictability exists regarding the transferability of college credits earned by secondary students. The purpose of this research is to determine the relationship between the selectivity level of a university and that university's willingness to accept either an associate degree or the transfer credits from an early credit provider – particularly that of intensive dual enrollment programs.

OVERVIEW

While the term *college preparatory* has been historically applied to high schools that offer a robust construct of academic coursework, the expression *college integrated* may be a more appropriate, contemporary descriptor. Clark (2009) found that a staggering 87 percent of all high schools in the United States offered some form of college credit to their students. Secondary students in America can earn college credits through a variety of established programs, including Advanced Placement (AP), International Baccalaureate (IB), Tech-Prep, middle colleges, dual enrollment (DE), and early colleges. Each of these early credit options will be described later in this chapter.

The *early college* is a relatively new and robust dual enrollment delivery model. The early college utilizes a program commonly called *intensive dual enrollment* (IDE), which allows students to earn approximately 60 college credits and an associate degree while still in high school. The transferability of credits from dual enrollment (DE) programs, and more particularly, from intensive dual enrollment programs is the primary focus of this research. However, the rate at which universities accept transfer credit from other early credit providers will also be explored for comparison purposes.

STATEMENT OF PROBLEM

While numerous researchers (Heggen, 2008; Hoachlander, Stearns & Studier, 2008; Johnstone & Del Genio, 2001; Krueger, 2006; Rasch, 2002) note that the unpredictability of the transferability of dual enrollment credits into higher educational institutions is a major concern, none of the current research attempts to directly study or quantifiably describe this problem. Instead, the body of contemporary research on dual enrollment focuses primarily on two separate aspects of DE programs: 1) the academic success of students during their dual enrollment experiences through the completion of their baccalaureate degrees; and 2) the motivational feature that dual enrollment seems to possess to impel students from low income communities into higher education.

Furthermore, since intensive dual enrollment is designed to offer substantial quantities of college credit to highly capable, secondary school upperclassmen, it is reasonable to believe that many of these precocious students will be interested in completing their undergraduate degrees at selective colleges and universities in the United States. Hence, the answer to the question of transferability of IDE credits to the most selective American universities is practical, timely and important.

SIGNIFICANCE OF THE THESIS

This study is designed to clarify some of the ambiguity that exists with regard to the transferability of dual credit into selective American colleges and universities. Several constituencies within the American educational system will benefit from the outcomes of this study: secondary school administrators, secondary guidance counselors, school parents, current and future DE students, and higher education decision-makers.

High school administrators who currently participate in a DE program or those who are considering a DE program will benefit from a greater understanding of the intended transferability outcomes of the dual credits. Administrators at private high schools will be offered a clearer vision of the potential marketability of DE courses. Guidance counselors will be afforded a stronger set of guidelines for steering strong students into DE programs, and be able to discuss credit transferability with parents and students with a greater level of confidence.

As students and their parents consider matriculation into an intensive dual enrollment program, they should be informed about the potential for the transferability and the non-transferability of college credit – particularly as it relates to the selectivity level of their target universities. Finally, this research will provide decision-makers in higher education with information about the approaches taken by the higher tiers of American colleges and universities with regard to the recognition of dual credit.

RESEARCH QUESTIONS

Students who enter an early college (an intensive dual enrollment program) expect to earn an associate degree by the time they finish high school. If such a student is accepted into a selective university (that does not have an existing articulation agreement with the college academy), does the level of selectivity of a university affect the university's willingness to recognize a dually-earned associate degree, and allow the student to commence with junior status? If the student is not given junior status, what quantity of postsecondary credits will be honored? What is the correlation between the level of selectivity of the university and the number of dual credits a student will be permitted to transfer into that university?

The two questions stated above can be reframed as null hypotheses for the purpose of this research. The two null hypotheses of this study are:

Null Hypothesis 1. The level of selectivity of a university has no effect on whether or not the institution will recognize the completion of an associate degree for students who have completed their coursework at an early college.

Null Hypothesis 2. The level of selectivity of a university has no effect on the quantity of dual credits that can be transferred into that university.

OVERVIEW OF EARLY CREDIT OPTIONS

Several programs exist which provide early credit to American high school students. These programs can be separated into two major types, which are dual credit programs and credit by exam programs. Figure 1.1 provides a framework that summarizes the relationship between the most common early credit options.

Early Credit Providers

Dual Credit	Credit by Exam
General Dual Enrollment (A La Carte Courses)	Advanced Placements (AP)
Early Colleges / Intensive Dual Enrollment	International Baccalaureate (IB)
Middle Colleges	College Level Examination Program (CLEP)

Figure 1.1: Early Credit Providers

This research examines the specific question of the transferability of an associate degree earned at an Early College's Intensive Dual Enrollment program into a selective American university. From conversations with several high school guidance counselors and numerous college admissions counselors, the researcher assumes that not all selective universities will accept the associate degree. Hence, the researcher will also assess the wider topic of how dual credits of any type will transfer to America's selective universities. For comparison purposes, data will be collected on how selective universities deal with the transferability of credit from some of the Credit by Exam providers. The following is a description of several of the early credit programs available to American high school students.

General Dual Enrollment (DE). Dual enrollment (DE) is a program in which high school students enroll in actual college courses, and concurrently receive secondary and postsecondary credit for each course. Dual credit programs award credit based upon teacher-assigned grades. Dual enrollment courses may be taught on either high school or college campuses, and may be led by either college-approved high school teachers or college professors. According to Clark (2009) and Cassidy, Keating & Young (2010), national data are rare with regard to the number of high school students participating in dual enrollment programs, but states that systematically track K-16 data claim strong enrollment growth in dual programs.

Some states have been frontrunners in the development of policy for this arena. The state of Washington launched its Running Start program in 1990, encouraging precocious high school students to get a jump on college courses. Florida lawmakers developed an elaborate articulation agreement between high schools and colleges,

providing a standard naming and numbering sequence for all dual enrollment courses. This course and credit articulation agreement guarantees that Florida universities will accept dual credits from student applicants. Additionally, the agreement allows university registrar offices to seamlessly match dual enrollment classes with courses in the institution's course catalogs (Andrews, 2000).

The majority of dual credit courses are offered to high school students through community colleges. Chapman (2001) suggested that community colleges have an opportunity through dual credit partnerships to swell their enrollment, and consequently expand their state funding. He cited a particular two-year college that grew conscription from 600 students to over 2,000 in an 18-month period through the adoption of dual enrollment. Kleiner (2005) asserted that 98 percent of all public community colleges offered courses to high school students during the 2002-2003 academic year.

Dual enrollment's association with community colleges has raised the question of the level of rigor in dually offered courses. Some states have attempted to combat this perception with specific jargon directed toward dual enrollment courses. The North Dakota University System (1999) described their dual enrollment offerings by stating that the dual credit course taught in the high school is a college course that happens to offer high school credit, rather than a high school course that happens to produce college credit.

Early college / Intensive Dual Enrollment. Early colleges were created to offer high-powered college coursework to a relatively small group of talented high-school-aged students. The early college platform is structured so that enrolled students will earn a full associate degree by the time they graduate from high school. Intensive dual

enrollment is, in effect, a dual credit program that is calibrated to offer two years of college work, rather than simply offering á la carte college credit. In 2012, the state of Florida offered sixteen early colleges of this type. They are called college academies and are located on the campuses of several four-year public colleges, as well as on the campuses of some community colleges.

Middle colleges. Middle colleges offer a form of dual enrollment, targeted specifically toward low-income communities. Middle colleges do not use an intensive dual enrollment model. Instead, middle colleges offer a mix of some credit bearing dual credit courses along with traditional high school courses to their students. Middle colleges have received tremendous financial support from the Bill and Melinda Gates Foundation, the Ford Foundation, the Carnegie Foundation, and the W.K. Kellogg Foundation. The underlying assumption in the middle college concept is that allowing secondary students to earn some college credit might encourage them to persist in high school through graduation, and become first-generation college enrollees after high school graduation. Bailey & Karp (2003) and Aldeman (2006) agreed that very little research had been done to determine what effect middle college credits had on the students' persistence through postsecondary studies. Dougan (2005), a critic of middle colleges, stated that well-established principles of effective learning are jeopardized when high school students with marginal academic records are encouraged to enroll in college courses.

Proponents of middle colleges argue that first-generation college attendees will be more apt to pursue a college degree if they are offered a head start on college credits. Aldeman (2006) found that college students who have earned at least 20 credits by the

end of their first year of college enrollment experienced significantly higher persistence in degree completion than students who did not accrue that number of credits. Aldeman added that taking college courses while still in high school afforded the at-risk learner with a critical and effective transitional process for his pathway to college.

In recent years, some middle college programs have adopted the early college label. This action has caused some of the original early colleges to attempt to draw distinctions between themselves and the emerging middle college institutions. The following section provides an explanation of differences in middle colleges and early colleges.

Contrasting Middle Colleges and Early Colleges

A pertinent distinction exists between the target students in an early college and a middle college. Early colleges primarily design their programs with an assumption that their students will be highly capable, precocious, and college-interested. Middle colleges design their programs with dropout prevention and first-generation college attendance as a principal goal. Additionally, early colleges tend to deliver high numbers of college credits to their students (approximately 60 credit hours), while middle colleges tend to offer only a handful of college credits to their students.

Since the early college targets a highly capable student, and a middle college targets drop out prevention students, one could assume the existence of a difference in the academic rigor of the two programs. In recent years, programs that would typically fall into the middle college arena are choosing to identify themselves as early colleges. However, colleges and universities are not easily able to create separate transfer policies

for the two types of early credit providers. Hence, credit transfer policy and practice could possibly be confused by these dynamics.

Advanced Placement (AP). The Advanced Placement program began in the early 1950's with the goal of providing college-level work and college credits to capable, high-school-aged students. The Ford Foundation collaborated with Harvard University, Princeton University, and Yale University to launch the program that is now managed by the College Board and offers 37 different Advanced Placement exams in 22 subject areas. In 2012 approximately 3.7 million AP tests were administered when American high school students took the national tests in May. According to the College Board's Report to the Nation (2013), the AP program has more than doubled every decade since its inception in 1950.

States approach the AP program in several different ways and with a variety of goals. Arkansas, for example, has recently adopted a state law which mandates all school districts to offer at least one AP course in each of the four core academic areas (Michelau, 2006). Arkansas, Georgia, Oklahoma, and Wisconsin pay the $87 fee associated with each AP test, whereas other states pass the expense to the parents of the test-taker. Texas provides financial incentives to teachers if their students score well on AP exams (Jackson, 2007).

West Virginia and Wisconsin require colleges in their states to accept all Advanced Placement credits, provided the student has earned a score of three or higher on the AP exam (Michelau, 2006). According to the College Board's AP Report to the Nation (2013), 32 states had created a statute or board policy related to the AP program by 2012.

International Baccalaureate (IB). The International Baccalaureate program is not as popular in the United States as the ubiquitous AP program. High schools must apply for the IB program and must be approved through a rigorous selection process to offer the Swiss-based curriculum at their site. Although there are significant similarities between IB and AP, postsecondary institutions appear to distinguish between the two programs. According to Michelau (2006), 91 percent of colleges and universities accepted AP credits, whereas only 48 percent of all postsecondary institutions granted credit for IB courses. The International Baccalaureate program has grown at an average annual rate of five percent over the last several years. According to the International Baccalaureate website (2013), IB was an active presence in approximately two percent of US high schools in 2013.

AP and IB credit differs from dual credit in three primary ways. First, AP and IB courses are high school courses that provide college credit, whereas dual courses are actual college courses that are taught to high school students. Second, AP and IB programs tend to qualify students for college credit by virtue of student scores on an end-of-course standard test, whereas dual credit is awarded based upon the teacher assigned grade in the course. Finally, dual credits are documented on an actual college transcript when they are initially earned, while AP and IB credit are not initially documented on a college transcript.

College Level Examination Program (CLEP). The College Board developed CLEP tests approximately 40 years ago. Students can register to sit for any of 33 different CLEP examinations from five different subject areas to earn college credit. Unlike AP and IB, this program is not associated with any particular classroom

instruction. Instead, it is a standardized assessment of an individual's previously attained knowledge in a specific area, such as American history, pre-calculus or Spanish I.   A score of 50 or above is the standard benchmark indicating the student will receive credit at a college that recognizes the CLEP program. About 2,900 colleges accept CLEP credit ("CLEP," 2013).

SUMMARY OF METHODOLOGY

Participants. College admissions professionals from the 235 most selective universities in America served as the participants in the study. The college admissions professionals were asked to take part in an online survey that asked for their college's general transfer practices for dually earned associate degrees and dually earned credits. *Barron's Profiles of American Colleges* was chosen as the measure of selectivity of the higher educational institutions in the study. Only colleges and universities in the United States were targeted in this study.

To identify the best participant from each institution, I searched each college's website to identify the most appropriate contact and, when possible, email the survey directly to that person. If no individual email address was listed on the website, the survey was sent to the general college admissions website of the school, with directions to forward the survey to the most appropriate person to respond to the survey questions.

Instrumentation. I developed an online survey (Appendix A). The survey was trial tested with a total of 10 colleges and was consequently revised for content and clarity. A further explanation of the survey refining process is provided in Chapter 3.

Data Collection Procedure. The survey collected data that represented selective colleges' practices regarding the recognition of a dually earned associate degree and their

practices related to their acceptance of dually earned college credits. Chapter 3 of this research will further define the design of the study and the methodology.

ASSUMPTIONS, LIMITATIONS AND DELIMITATIONS

Assumptions

- The outcomes of this research assume that the respondents to the survey are well-informed about their institutions' practices regarding the transfer of early credit, and that they have answered the questions on the questionnaire truthfully.

- The study assumes that dual enrollment, and particularly intense dual enrollment, will continue to exist in the future, and that schools that offer it will have some level of advantage over schools that do not.

Limitations

- A sample of 90 respondents was collected from a population of the most selective 235 colleges and universities in the United States. This sample represents an overall response rate of 38.3 percent. Each of the higher educational institutions in the population was contacted for the purpose of collecting the research data, but only those who responded to the electronic survey or those who responded to the follow-up phone calls were included in the study. Hence, the sample size of the study is a limitation. With an error rate of less than .05, a respondent rate of 90 from a population of 235 results in a confidence level of only 80%.

- The sample only includes responses from the institutions that chose to respond to the study.

- Another limitation of the study is that only one independent variable (predictor variable) was utilized in the model. Typically, logistic regression models employ

several independent variables, which control for other variables that may be related to the outcome.

- Yet another limitation of the study is the fact that a single university might allow each college or department to create its own credit transfer policies and practices. This means that the university itself might not have a single correct response to questions about their institution's credit transfer processes.

Delimitations

- The study is limited to the 235 universities listed in Barron's Selectivity Index. Therefore, although interesting and useful, the findings of this study may not be generalized to the credit transfer practices of other, less selective, higher educational institutions. It should be noted that there are approximately 4,500 institutions of higher education in the United States. Additionally, the scope of this study is limited to American universities. Therefore, this research limits its focus to the most selective five percent of that population. Although other popular, college-ranking mechanisms exist, such as those published by *US News and World Report* and *Forbes* magazine, the researcher chose to employ the use of Barron's index, as it focuses most specifically on the study's primary predictor variable of college selectivity.

- The use of a researcher-designed survey and the potential for researcher bias may possibly limit the results of the study. While the survey was approved by the committee chair and was tested with college counselors from colleges outside the population of the study before it was sent to the intended respondents, the potential for design flaws in the survey are a limiting factor of the research.

- All dual credits are on a transcript of an issuing college. Likewise, a dually earned associate degree is awarded from a college that partnered with a high school in a dual enrollment program. Some colleges involved with high schools in these dual partnerships are considered rather strong colleges. For instance, the University of Connecticut and Syracuse University are highly ranked schools that engage in large dual enrollment programs. Other dual enrollment programs are formed between high schools and by colleges with less prestige. It is possible that the perceived strength of the partnering college (in the dual enrollment partnership) will have an effect on whether dual credits or a dually earned degree transfers into a selective university. This research made no distinction between dual credits earned from a college with a lower perception of academic rigor, and that of a college with a higher level of perceived academic rigor. However, it is quite possible that the strength and reputation of the college from which the early credits are earned has some effect on the transferability rate of the credits to selective higher educational institutions.

TERMS AND DEFINITIONS

Articulation Agreement, in the context of this study, is a predetermined, written arrangement between a university system and a dual credit provider. Through standard course naming and numbering protocols and pre-reviewed course descriptions, the articulation agreement outlines a seamless recognition and acceptance procedure for the transfer of dual credit courses.

Barron's Profiles of American Colleges Selectivity Rankings

- *Most Competitive* colleges generally accept students scoring above 29 on the ACT and between 655 and 800 on SAT subtests, and in the top ten percent of their graduating class. Even superior students will face fierce competition to gain admission to colleges in this category.

- *Highly Competitive Plus* colleges generally accept freshmen cohorts with median SAT subtest scores of 645 or higher and ACT scores above 28. Successful applicants will typically graduate in the top 20 percent of their high school classes. This category of colleges will accept less than one quarter of their applicants.

- *Highly Competitive* colleges target applicants with SAT scores between 620 and 654 on the SAT and ACT scores that average 27 or 28. These schools generally offer acceptance to one third of their applicant pool of potential freshmen.

- *Very Competitive Plus* colleges accept freshmen classes with median SAT scores of approximately 610 on the SAT and 26 on the SAT. This category of colleges typically accepts approximately one third of their applicants.

College and *University* are terms that will be used interchangeably in this study. The researcher will recognize no difference between the two terms.

Credit by Exam is a term used to describe several programs that can offer college credit to students who take a specific test for the content of that course. Common credit-

by-exam providers are Advanced Placement (AP), International Baccalaureate (IB) and College Level Examination Program (CLEP).

Dual Credit refers to college credits earned by students who are still high-school-aged learners. Dual credits typically satisfy both high school graduation requirements and college degree credit requirements.

Dual Enrollment (DE) is a broad term that refers to courses offered to high-school-aged students through a partnership between a high school and a college. Dual enrollment programs can be offered on high school or college campuses, or even online. DE courses can be taught by high school teachers or college professors.

Early Credit is used as a broad term that encapsulates any college credits earned while the student is still enrolled in high school. Hence, any dual credits or credits by examination can be described as early credits.

Early College generally refers to a specific hybrid school that offers college-level courses to high-school-aged students. Early colleges are typically housed on college campuses and tend to offer intensive dual enrollment programs that culminate with an associate degree.

Intensive Dual Enrollment (IDE) is a specific type of DE program in which students are expected to earn approximately 60 college credits, or a full associate degree, by the time they graduate from high school.

Middle College is a type of dual credit provider that targets low-income and first-generation college attendees. Middle colleges offer college-level courses to high school aged students. Middle colleges differ from early colleges in that the primary target of middle colleges is low-income students, and middle colleges typically offer a much lower

number of credits to their students than the number of credits offered at early colleges. Even with these differences, it is somewhat common to read the terms, early college and middle college, used interchangeably in the literature about dual enrollment.

Selectivity is defined as the measure of difficulty that student applicants face in gaining admission into a university. Selectivity is measured in this study by *Barron's Profiles of American Colleges* (2009).

OUTLINE OF THE DISSERTATION

In subsequent chapters, the reader of this study will become familiar with the scholarly discussion around the topic of dual credit. Other forms of early credit will be briefly explored. A key component of the literature review is the absence of prior research on the transferability of dual credit and dually earned associate degrees. However, the matter of transferability is often described as an area in need of future research.

To investigate the matter of the transferability of dual credit and dually earned degree, the researcher surveyed admissions officers at America's most selective universities. A description of the data collection process and an explanation of the data analysis methodologies are included in chapter three.

Chapter four offers descriptive statistics of the 90 responding universities as well as an analysis of their responses to the survey questions. Logistic regression was used to compare the responses from the colleges in the *most competitive* classification with the responses from the colleges in each of the other three classifications of school selectivity. Several significant findings emerged from the analysis.

Finally, a summary of the analysis, including implications of the research and recommendations for further study are shared in the last chapter.

CHAPTER 2

LITERATURE REVIEW

The primary purpose of this research is to determine the relationship between the

selectivity level of a university and that university's willingness to accept transfer credits

from dual enrollment providers – particularly that of intensive dual enrollment programs.

Hence the researcher initially sought scholarly research in the specific area of

transferability of credit from an IDE program into selective universities. When a

thorough search of the literature revealed absolutely no direct research related to this

specific concept, the search was widened to that of transferability of IDE credits to any

post secondary institution. Again, the collective body of scholarly research was

practically silent on this specific topic. The search of literature was further widened to

include the transferability of general dual credit into any college or university. This

broadened search uncovered a large body of research on dual credit programs. This

assemblage of research on the topic of dual credit focused primarily, and almost

exclusively, on two areas: 1.) the academic success of college students who had taken

dual credit courses while they were in high school, and 2.) the motivational aspects of

dual credit courses that led underserved high school students to persist toward college

matriculation.

Several studies (Heggen, 2008; Hoachlander, Stearns & Studier, 2008; Johnstone

& Del Genio, 2001; Krueger, 2006; Rasch, 2002) cited the unpredictability of dual credit

transferability into higher educational institutions as a concern, and as an area in need of

further study. Yet no scholarly research had been conducted that dealt directly with the specific topic of dual credit transferability. When the issue of transferability of dual credit was mentioned at all in the review of the literature, it was only done as a suggestion for further research.

Karp and Jeong (2008) addressed the fact that little exploration existed on the topic of dual credit transferability. They suggest that the absence of data on this topic is due to a lack of coordination among individual high schools, local educational systems, postsecondary institutions, and state agencies.

Since the volume of literature related specifically to dual credit transferability was too limited to serve as a foundation for this dissertation, the researcher ultimately widened the scope of the literature review to include dual enrollment history, variability, benefits and criticisms.

The vast majority of resources in this literature review were retrieved from the University of South Carolina's Thomas Cooper Library. An electronic search of the various education databases of articles and journals was conducted. Searches for research related to the transfer of dual credit yielded very few results. However, searches with keywords *dual+enrollment* and *early+credit* created a strong list of current research.

As resources on dual enrollment were secured, the reference lists of these resources were reviewed for additional, pertinent studies related to the transferability of dual credit. No studies directly related to transferability of dual credit were found. Hence, it is likely that this particular research is germinal to the topic of dual credit transferability, or among the first wave of scholarly research on the topic. It should be

noted that several resources highlighted the concept of transferability of dual credit as a problem that needed further research. With the apparent absence of direct research on this topic, the researcher was forced to compile resources about dual credit in general. When the reference lists at the end of each body of research revealed no significantly new resources, the literature search concluded.

LIMITATIONS OF THE LITERATURE

According to Karp, Calcagno, Hughes, Jeong, and Bailey (2007), three weaknesses in the body of research on dual enrollment should be noted. First, most states lack comprehensive data systems for K-16 or K-20 programs. Consequently, most research pertaining to DE relied on fairly small samples of the desired student populations. Second, self-selection is an inherent issue in any attempt to select random samples of dually enrolled students. Therefore, controlling for preexisting student characteristics was difficult. Third, the preponderance of the data showed positive results in academic outcomes and persistence toward a college degree. However, these findings may be due to factors that were not accounted for in the statistical models employed by the researchers.

DEFINITIONS

Dual Enrollment (DE) is defined as collaborative efforts between colleges and high schools in which secondary students are given the opportunity to enroll in college courses. Most dually enrolled students will receive both high school credit and college credit for each course taken within the program (Hoffman, Vargas & Santos, 2008; Karp & Jeong, 2008). In some cases, however, dually enrolled students will seek only college credit for a specific college course they take while still in high school.

The terms *concurrent enrollment* and *dual credit* are often used to describe the specific dual enrollment programs in which credit is received at both the secondary and post-secondary levels (Andrews, 2001; Hughes, Karp, Bunting, & Friedel, 2005; Karp, Calcagno, Hughes, Jeong & Bailey, 2007).

Intensive Dual Enrollment (IDE) refers to a specific dual enrollment program in which high-school-aged students complete an associate degree and their last two years of high school at the same time (Heath, 2008). Students in this program take college courses, which also satisfy their high school graduation requirements. The state of Florida offers 16 different sites for intensive dual enrollment, and refers to these campuses as *college academies* (Heath, 2008).

Articulated Credit programs ensure curricular alignment between college-level courses taught in a dual enrollment setting and the same courses offered at specific postsecondary institutions. In many cases, articulated credit classes will be identified with the same course numbering system as that of the university system through which it is offered (Kim, Barnett & Bragg, 2003), allowing the transfer of credit to that particular university to be as seamless as possible.

BRIEF HISTORY OF DUAL ENROLLMENT

In 1955, the High School Cooperative Program was launched by the University of Connecticut's President Albert Jorgensen. This program is the longest-running concurrent enrollment offering in the nation. It is now called the Early College Experience (ECE), and reaches approximately 9,000 high school students in 160 Connecticut high schools (University of Connecticut, 2013).

The concept of highly motivated and capable high school students taking college courses at their high school was not new. Legendary University of Chicago president, William Rainey Harper, believed that the first two years of college should be completed within a student's local community. Harper developed the idea of a junior college on the campus of a traditional high school, at which students could complete their first two years of college work (Stoel, 1988). The concept was not popular among the faculty at the university, and was only tested at a single location, Joliet High School / Joliet Junior College, in the Chicago area.

A more modern success story of dual enrollment is Syracuse University's Project Advance. SUPA was launched in 1972 as a partnership between Syracuse University and six Syracuse-area high schools. The program was offered in 40 New York high schools by 1974, and quickly served as a model for similar programs in other states. Syracuse University Project Advance now serves approximately 9,000 dually enrolled students in approximately 200 schools (Syracuse University Project Advance, 2013).

Secondary educational institutions tend to be highly isomorphic, allowing popular ideas to propagate to other schools and school systems rather quickly. The success of the Connecticut ECE program and Syracuse's SUPA have paved the way for dual enrollment to now exist in all 50 states (Andrews, 2004). By 2006, legislation about DE was present in 42 states. There are no official national data regarding the approximate conscription in DE courses. However, Kleiner & Lewis (2005) estimated that approximately 800,000 American high school students were enrolled in at least one college course.

In 1999, the National Alliance of Concurrent Enrollment Partnerships (NACEP, 2009) was formed to ensure that college courses offered by high school teachers are as rigorous as courses offered on the sponsoring college campus. The NACEP exists to promote the growth and refinement of dual enrollment programs in the United States.

VARIABILITY OF DUAL ENROLLMENT PROGRAMS

While all DE programs are designed to provide college-level courses to secondary students, a rather wide level of variability exists in the manner in which the programs are facilitated and operated nationwide (Karp, Bailey, Hughes & Fermin, 2004). Four primary areas of variability surfaced most often in the review of the literature: student eligibility, instructor qualifications, program funding, and delivery locations.

It should be noted that the independent variable in this study is the selectivity level of the college that receives or denies the dual credit earned by a student in a dual enrollment program – particularly the student in an intensive dual enrollment program. The study does not attempt to consider the selectivity level of the college that initially issues the dual credit through a dual enrollment partnership with a cooperating high school. This fact is listed as one of the delimiting factors of the study. The primary reasons for not considering the selectivity level of the dual partner college that originally issues the dual credit is that most of the cooperating colleges in dual credit partnerships are community colleges, and nationwide ranking metrics for community colleges are nonexistent.

Student eligibility. Since dual enrollment programs necessitate college matriculation, the cooperating postsecondary institution determines entrance requirements. Kleiner (2005) found that 15 percent of participating colleges required no

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specific academic conditions for students to enter their dual enrollment program. Of the 85 percent of colleges that did have entrance requirements for their high-school-aged students, only 38 percent reported that the requirements were the same as admissions standards for their regular college students. The Kleiner findings also noted that 66 percent of colleges required a minimum high school GPA, but the GPA could be as low as 1.75 in some cases. Other institutions required grade point average minimums of 3.75. Standardized test scores were also utilized by some colleges, as were placement tests and guidance department recommendations.

Instructor qualifications. Variability in instructor qualifications existed as well. Andrews (2000), Chapman (2001), and Kleiner (2005) addressed instructor credentials and preparation in dual credit programs. When dual enrollment courses are offered on a college campus, college faculty primarily lead them. However, when these courses are offered on high school campuses, Kleiner (2005) discovered that schools utilize college professors 26 percent of the time, high school teachers 32 percent of the time, and a combination of college and high school instructors 42 percent of the time.

The state of Florida requires that dual enrollment courses and college academy courses be taught by faculty who have completed at least 18 graduate semester hours in the teaching discipline and hold a minimum of a masters degree (Andrews, 2000). The literature did not make an apparent distinction between instructor qualifications for middle college and those of early colleges.

Program funding. Students who take advantage of dual credit offerings are concurrently counted in the FTE totals for both the cooperating high schools and colleges. Since funding for public secondary schools and public colleges are based upon

FTE counts, state and local policymakers have had to work through solutions regarding the funding of the two institutions with regard to dual enrollees.

Hunt (2007) found that public colleges offering dual enrollment programs almost always receive full state funding for the courses taken through a dual credit platform. However, the colleges will typically waive the standard tuition that would have been paid by the student. According to Hunt, high schools with dual programs may be funded with less than proportionate FTE values for dually enrolled students. She noted that high schools that received a higher level of funding for dual credit courses were more apt to have guidance departments that encouraged capable students to apply for dual credit programs.

When private colleges or private high schools are involved in dual enrollment, the individual institutions are free to determine their own funding mechanisms. Guilford College, a private liberal arts college in Greensboro, North Carolina, partners with the Guilford County Public Schools to offer a college academy program. Guilford College discounts their standard tuition rates to match the county's normal per pupil funding rate and collects that amount for each public school student in the program.

In Tennessee, high school teachers who teach dual courses are paid their full salary, plus a college adjunct salary. Additionally, lottery-funded, college scholarship dollars are available to Tennessee high school students who take dual enrollment courses ("Tennessee Government," 2013). Students in the University of Connecticut's dual enrollment program pay the university approximately $100 per course. However, the university does not pay a stipend to the adjuncts that teach in their Early College Experience program.

Middle colleges have enjoyed significant funding through foundations such as the Bill and Melinda Gates Foundation, the Ford Foundation, the Carnegie Foundation, and the W.K. Kellogg Foundation (Gullatt and Jan, 2003). They also receive funding through local school systems. Because middle colleges target primarily low-income demographics, there are typically no program fees that get passed on to families of the enrolled students.

Delivery locations. According to the National Alliance for Concurrent Enrollment Programs (NACEP, 2009) dual enrollment courses can be delivered in secondary schools, in traditional college classrooms on college campuses, or in pullout programs on college campuses. Intensive dual enrollment programs are usually offered on a college campus.

EFFECTS OF DUAL ENROLLMENT ON COOPERATING HIGH SCHOOLS

Dual enrollment programs provide an opportunity for collaboration and partnership between secondary and postsecondary institutions. Several potential benefits emerge from the partnership, including shared costs, increased academic dialog, and efficient use of facilities (Amey, Eddy & Ozaki, 2007).

The American Association of State Colleges and Universities (2002) cited two key benefits of dual enrollment for participating high schools. The first benefit stems from high schools understanding more about the specific expectations of college-level learning. It is reasonable to believe that curricular offerings in high schools could be expanded and improved as a result of a stronger level of familiarity with the postsecondary mindset. Second, dual enrollment programs may help connect

participating high schools to community and business resources historically associated with colleges and universities.

Other research offered counter positions on these two benefits. Museus, Lutovsky and Colbeck (2007) offered a concern they called "general equilibrium effect" which proposed that when high schools focused on academic improvements of the dual classes, they would ultimately lose the drive to improve the academic strength of the regular (non-dual) classes populated by the typical student. This effect would further exacerbate the inequities in learning opportunities for high school students. Rasch (2002) suggested that colleges would eventually develop an adversarial view of dual enrollment programs if secondary and postsecondary institutions competed for the same community and business resources.

In 2006, Jobs for the Future (JFF) was commissioned to evaluate Rhode Island's dual enrollment program and provide an analysis for future action. JFF found that dual enrollment targeted two very different sets of students. Some dual programs existed to offer college-level coursework to highly capable students. Other dual credit platforms were designed as dropout prevention programs, intent on encouraging first generation college experiences for underserved students. JFF divided the dual programs into those at comprehensive high schools, and those at urban high schools. The research further denoted the different purposes of the two types of dual enrollment programs in Rhode Island.

Comprehensive high schools with a traditional college preparatory curriculum cited four main purposes for their DE programs. The programs aimed to offer:

1. a rigorous set of academic experiences for high-achieving students who need to be challenged beyond the typical high school curriculum;

2. a mechanism to accelerate time to degree;

3. a straightforward opportunity to decrease the cost of college;

4. a vehicle to impart college-level skills to students who are ready for such opportunities.

For urban high schools that enroll a high percentage of at-risk students, dual enrollment primarily serves to:

1. introduce and develop the core skills and mindset needed for students who would be the first in their families to enroll in college;

2. bridge the social and cultural chasm between low-income families and their more affluent counterparts.

Herein lies another problematic issue in the collection of data in the area of dual enrollment. Multiple researchers have noted that the contemporary target of DE programs is directed toward two rather distinctive demographics. One is the highly capable, highly precocious, college-ready teen from a rigorous high school. The other target is the bright, often underserved student from an urban community. Both sets of programs approach dual enrollment with a different set of goals. However, both paradigms contribute to the same overall data sets, which eventually serve as the basis of research and analysis on the topic of dual enrollment (Andrews, 2004; Bailey and Karp, 2005; Boswell, 2001; Farrell and Seifert, 2007; Gullatt and Jan, 2003; Hoffman, 2003; Krueger, 2006; Lee, 2009; Lerner 2006; Vargas, 2005; Venezia, 2003).

EFFECTS OF DUAL ENROLLMENT ON COOPERATING COLLEGES AND UNIVERSITIES

According to the American Association of State Colleges and Universities (2006) DE programs can substantially grow enrollment of postsecondary institutions, as well as grow total revenue, which is tied to overall enrollment. A student that earns college credit through a DE partnership with a college, is apt to consider matriculating into that college for the completion of the degree. Boswell (2001) and Clark (2001) state that dual credit programs increase a higher educational institution's visibility in the community and promote a positive image in the surrounding area.

Dual enrollment has been associated with positive gains in building a more socioeconomically and racially diverse student body (Jordan, 2009). However, university officials cite a concern over the matter of quality control for the DE courses, particularly those taught on high school campuses (Hughes, 2010).

SUMMARY OF BENEFITS OF DUAL ENROLLMENT

Numerous researchers have studied the benefits of dual enrollment and have created a sizeable list of the positive outcomes of the programs (Bailey, Hughes & Karp, 2003; Blanco, Prescott & Taylor, 2007; Conklin, 2005; Karp, Calcagno, Hughes, Jeong & Bailey, 2007; Kim, 2006; Kleiner, 2005; Venezia, Kirst & Antonio, 2003). This inventory of overarching benefits for all DE programs includes:

1. synergistic partnerships between secondary and postsecondary institutions;

2. increased rigor in secondary education;

3. reduction of cost for a college education;

4. reduction of time to completion for a college degree;

5. enhancements of high school curriculum;

6. improved use of senior year of high school.

Additional benefits are cited specifically for DE programs in schools and communities where students are generally underrepresented in college attendance. These benefits include:

1. reduction of high school dropout rates;

2. increased student motivation to attend college;

3. ease of recruitment of students to college.

The potential benefits of dual enrollment are further pronounced by recent national data. The total college indebtedness of all Americans passed the one trillion dollar mark in 2012 (Nance-Nash, 2012). In the previous year, the average number of years spent toward completion of a bachelor's degree was 4.5, (Johnson, 2011). Early credit is continually cited among the solutions to these two issues. Additionally, early credit is recognized as a first step into college for first-generation attendees – leading toward a rise out of poverty for students in socioeconomically depressed areas of urban America.

Adams (2012) studied the question of college persistence for graduates of dual credit programs. Adams found that when controlled for academic ability and socioeconomic factors, students who had been dually enrolled matriculated into their second year of college at twice the rate of the control group, and persisted through a bachelor degree at a rate of 1.7 times that of the control group.

SUMMARY OF CRITICISM OF DUAL ENROLLMENT

Accelerated learning options and dual credit programs are sometimes seen as synonymous. However, McKeon (1995) stated that before we can really define

accelerated learning, we should understand what it is not: It is not simply adding speed to the learning process. He contends that accelerated learning should take place in a stress-reduced environment, rather than the high-stakes setting so familiar to the typical Advanced Placement classroom. Accelerated learning should foster academic depth and elicit learning enjoyment, rather than simply provide a path of reduced years toward the acquisition of a baccalaureate degree.

Rhodes (2007) offers a more stinging viewpoint. He asserts, "At a national level, student performance on a variety of tests indicates that students in the U.S. are falling behind students in other countries on performance measures of proficiency in math, science, geography, basic literacy, etc" (p. 9). So why would our nation's schools place so much effort in creating these accelerated options for some students, when the standard curriculum is not providing adequately challenging learning experiences for all students? He suggests that acceleration, which would bring the greatest benefit to our nation, would be focused on the acceleration of producing highly effective methods in the regular classrooms of the regular schools with the average students.

Zimmerman (2012) agrees with Rhodes. He asserts that the high school environment cannot justifiably reproduce the academic milieu of the college campus. Furthermore, high school students generally do not have the same breadth of personal experiences from which to draw, as do traditional college students. Zimmerman asserts that the rigor level of American high schools certainly needs improvement, but not by the incorporation of college courses into their repertoires.

Rhodes notes that the dual credit efforts are concentrated on the tails of the bell curve. That is, exceptional students and dropout prevention students are the primary

beneficiaries of DE programs. The student who finds himself in the middle of the bell curve is less likely to be associated with any form of early credit program.

TRANSFERABILITY OF DUAL CREDITS

In 2008, Hoachlander, Stearns & Studier recommended that the state of California devise and adopt a pattern of improved communication regarding the requirements and transfer of college credit for concurrent or dual enrollment credits. Krueger (2006) shared a similar proposal, suggesting that a fairly straightforward, predictable mechanism for credit transfer is an essential component of any dual enrollment program. Krueger noted that critics of dual enrollment often mention that dual credits might not be accepted at the college or university of the student's choice.

No national standards exist for the transfer of dual credit. Some states have created their own policies on credit transferability, mandating specific action on the part of public universities. For instance, public universities in Florida are compelled to accept students who have earned an associate degree from an IDE program. Similarly, students in Minnesota's Post Secondary Education Options program are guaranteed the transfer of dual credits into a four-year public university in the state (Johnstone & Del Genio, 2001). Other states have no policies on dual credit transfer, leaving those decisions in the hands of each individual college or university. As expected, private institutions of higher education are free to create their own protocols for the acceptance of transfer credits.

From the higher education perspective, site-based decisions about the transferability of dual credit are almost always closely linked to the perception of instructional quality of the courses. New York University announced (Heggen, 2008) that it will no longer award transfer credit for any course that was used to meet the

requirements of high school graduation. The decision, crafted by the undergraduate deans, was based on the idea that dual credit courses were not "verifiable" with regard to their academic rigor. The deans asserted that college credit was only appropriate for college-level coursework. Heggen noted that the term *college level* is, however, one without a universally accepted definition. It is interesting to note that NYU continues to accept AP courses for credit, since the AP end-of-year exam meets the university's standard for quality and academic rigor.

Rasch (2002) found that several dual enrollment programs attempted to combat the concerns about credit transferability by listing four-year universities that would accept the dual credit. The website for the University of Connecticut takes the reverse approach, and lists the dual credit programs from within the state that are transferable to the four-year university. The University of Wyoming ("UW seeks transfer students," 2011) claims that enrollment in the state's DE programs and in the University itself have benefited from an articulation agreement that guarantees transfer of dual credit.

Florida has created an articulation agreement between DE providers and the state university system, with a common course numbering system for DE courses and their university-delivered equivalents (Hunt & Carroll, 2006). Hence, Florida students are afforded a much more straightforward approach to credit transferability if they matriculate at a college within the state. Students in Florida's college academies are guaranteed that the associate's degree they earn (while still in high school) will be recognized at one of the state universities. Florida students who leave the Sunshine State are afforded no such predictabilities with their early credit or with their two-year degrees.

CONCLUSION

While reviewing the body of literature around the topic of dual enrollment, the researcher was struck by the two primary, but different approaches to dual credit programs. Those two approaches are the strengthening of academic rigor for advanced students in comprehensive schools, and the matter of expanding college access for underserved students in low-income schools. DE is seen as a viable and practical solution to both of these matters.

Various state legislation and local decision making on dual enrollment seems to be focused on only one of the two different perspectives, ultimately considering the needs of one targeted set of students over the other group.

None of the literature suggested that the growth of DE programs would wane in the coming years. While no national data exists, inferences from community and state numbers on the growth of dual programs point toward solid growth over the next several years. Considering this propensity for enrollment growth in DE, and the literature's call for further study on the issue of transferability of DE credit, the ensuing study is timely and important.

CHAPTER 3

DESIGN AND METHODOLOGY

The purpose of this study is to review the relationship between the selectivity of a university and the university's general practices of accepting early credits from dual credit providers. Particular interest is given to the transferability of early credit associate degrees into selective universities. This chapter will include a summary of the population and sample of the study, an explanation of the instrumentation utilized in the research, and a review of the data collection and data analysis processes.

POPULATION AND SAMPLE

Barron's Profiles of American Colleges (2009) ranked US higher educational institutions by selectivity in admissions. Two hundred thirty-five colleges and universities are ranked in the top four categories in the Barron's selectivity index, and can thus be reliably considered among the most selective colleges in America. The top four categories are described as *most competitive*, *highly competitive plus*, *highly competitive* and *very competitive plus*, and the categories consisted of 81, 36, 73 and 45 members, respectively. Barron's ranked 1,650 of the 4,495 degree-granting higher educational institutions in the United States (National Center for Education Statistics, 2013). Hence, the 235 schools represent the top 14 percent of the Barron's ranked colleges, and the top five percent of all higher educational establishments.

The researcher acknowledges the existence of other, more popular, college ranking lists. *US News and World Report* publishes an annual ranking of American

colleges that could have been utilized in the study. However, the *US News* rankings

separate higher educational institutions into four different groups (national universities,

national liberal arts colleges, regional universities and regional colleges) before they

begin ranking the schools. The *US News* rankings only compare colleges within a group

with other colleges in that same group. Hence, there is no comparison between a national

university, such as Vanderbilt University, and a national liberal arts college, such as

Amherst College. This segmenting of their college rankings created a dilemma for the

research model of this study. *Forbes* also compiles an annual ranking of colleges;

however, these rankings are simply ordinal, and no natural cutoffs of higher and lower

rankings are part of their design. Barron's rankings focus on the concept of selectivity,

which is the key characteristic of the independent variable of this research design. The

Barron's rankings offer clean tiers in their ranking system, which allow for a natural

cutoff in the selection of the colleges included in the study.

All of the 235 institutions in the population were contacted to participate in this

study. In all, 90 unique and complete responses were collected from the population, and

these 90 schools served as the sample for the study. Table 3.1 represents data describing

the number of colleges in each category and the participation rates from each of the four

levels of college selectivity.

Table 3.1

Number and Percentage of Respondents per Barron's Selectivity Category

Selectivity Ranking	Total Number of Colleges in Group	Number of Complete Responses	Percentage of Responses by Category
1: MC*	81	27	33.3%
2: HCP*	36	12	33.3%
3: HC*	73	23	31.5%
4: VCP*	45	28	62.2%
Total	235	90	38.3%

(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

Descriptive information about the colleges in the sample. Descriptive data was collected from each of the 90 colleges that participated in the research. Each college stated whether it was public or private and cited the number of undergraduate students enrolled in the fall of 2013. This information was not integral in addressing the core questions of the study, but it was useful in determining any other possible factors that might contribute to higher or lower transfer rates of dual credit into the nation's most selective colleges. Table 3.2 summarizes the breakdown of public and private universities in the study.

Table 3.2

Distribution of Public and Private Colleges in the Sample

Selectivity Ranking	Public Colleges/ (percentage)	Private Colleges/ (percentage)	Total
1: MC	2 / (7.4%)	25 / (92.6%)	27
2: HCP	2 / (16.7%)	10 / (83.3%)	12
3: HC	9 / (39.1%)	14 / (60.9%)	23
4: VCP	7 / (25.0%)	21 / (75.0%)	28
Total	20 / (22.2%)	70 / (77.8%)	90

(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

Table 3.2 indicates that approximately 78 percent of the total sample of the study is private colleges, and 93 percent of the *most competitive* colleges that responded to the survey are private. To determine whether the sample of this study is proportionally representative of the two types of colleges (public and private), Table 3.3 is provided. Table 3.3 shows a comparison of public and private college percentages in the sample with public and private college percentages in the population.

Table 3.3

Comparison of Public and Private Colleges in the Sample and the Population

Category	Sample Colleges		Population Colleges	
	Public/(percent)	Private/(percent)	Public/(percent)	Private/(percent)
1: MC	2 / (7.4%)	25 / (92.6%)	6 / (7.4%)	75 / (92.6%)
2: HCP	2 / (16.7%)	10 / (83.3%)	8 / (22.2%)	24 / (77.8%)
3: HC	9 / (39.1%)	14 / (60.9%)	22 / (30.1%)	51 / (69.9%)
4: VCP	7 / (25.0%)	21 / (75.0%)	10 / (22.2%)	35 / (77.8%)
Total	20 / (22.2%)	70 / (77.8%)	46 / (19.6%)	189 / (80.4%)

*(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive;
VCP=Very Competitive Plus)*

Table 3.3 shows that the public colleges in the sample of this study represent 22 percent of the total number of respondents, whereas public institutions comprise 20 percent of the total population. Upon further analysis, the population with selectivity ranking of *most competitive,* there are 81 total colleges; six are public colleges (7 percent) and 75 are private colleges (93 percent). The percentage of public and private colleges in the *MC* sample is exactly the same as the percentages in the *MC* population. Further inspection of the four separate selectivity categories shows that the sample and population for each breakdown of public and private colleges never differ by more than nine percentage points. Therefore, the sampling of public and private colleges seems to be rather proportionate to the population. Table 3.4 shows the itemization of the sample colleges by the undergraduate enrollment in the fall of 2013.

Table 3.4

Distribution of College Enrollment Totals (Undergraduate) by Selectivity Category

Category	Less than 1,000	1,000- 5,000	5,001- 10,000	10,001- 20,000	20,000+
1: MC	1	15	3	3	5
2: HCP	1	5	1	2	3
3: HC	0	4	6	6	7
4: VCP	2	12	3	3	3
Total	4 (4.4%)	41 (45.5%)	13 (14.4%)	14 (15.5%)	18 (20.0%)

*(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

Exactly half of the 90 colleges in the sample reported undergraduate enrollments of 5,000 or less. The other 45 colleges stated undergraduate enrollments of over 5,000 students. Table 3.5 is provided to show where public colleges fit into the categories of selectivity index and size of undergraduate enrollment.

Table 3.5

Distribution of Public Colleges by Enrollment Totals and Selectivity Category

Category	Less than 1,000	1,000- 5,000	5,001- 10,000	10,001- 20,000	20,000+
		(Public colleges in parenthesis)			
1: MC	1	5 (1)	3	3 (1)	5
2: HCP	1	5	1	2	3 (2)
3: HC	0	4	6 (1)	6 (2)	7 (6)
4: VCP	2	12	3 (3)	3 (2)	3 (2)
Total	4	41 (1)	13 (4)	14 (5)	18 (10)

(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

Table 3.5 shows that public colleges in the sample tend to be larger than the private colleges. Over half of the universities in the 20,000+ enrollment column are public colleges, whereas only one public college in the sample has an undergraduate enrollment of under 5,000.

In addition to the descriptive data from each college, information about the individuals who completed the surveys was also collected. The name, title of position, phone number, and email address of each survey respondent was garnered during the survey process.

INSTRUMENTATION

A 17-question, researcher-created survey (see Appendix A) was utilized in the study. The first six questions sought the name and state of the college, and the name and

contact information of the person responding to the survey. Questions seven through ten asked for descriptive information about the university, including public or private, student enrollment, tuition rates, and religious affiliation. The final seven questions on the survey probed into the college's practices regarding the transfer of various kinds of early credit, the recognition of associate degrees, and DE policies and trends.

The researcher wrote an initial draft of the survey in October of 2012. This preliminary draft was trial-tested at three different colleges. The original survey included an additional section that contained a sample student transcript from an intensive dual enrollment program. Those who took the survey were asked to evaluate the 60 college credits listed on the transcript, and determine if the applicant would be offered junior status at the college. If not, the next question asked the respondent to review the transcript and estimate the total number of credits that would transfer to their university, assuming the applicant was applying to the college of business or business department.

The college admissions representatives who participated in the three trial surveys suggested removing the transcript evaluation from the survey. They warned that a thorough transcript review is a lengthy and cumbersome process, and that including it in the survey would most likely diminish the survey return rate. The survey was reworked to ask the admissions counselors to describe their acceptance of various types of early credits by selecting one of five categories that best represented general practice at their institution.

The revised survey was tested with seven different colleges, none of which were included in the population of the study. Several minor changes in wording were applied to the survey, each adding a bit more clarity to the questions.

Key questions. Several central questions were asked of the survey respondents. The leading statement that set up these questions, as well as the actual core questions are as follows:

- Leading statement: "At most colleges and universities, several variables can affect the transferability of credits earned from other institutions. When responding to the following questions, please consider the most typical scenario at your institution, and select the response that best describes general practice."

- Does your college or university ever permit students who have earned an associate degree from a regionally accredited college to matriculate into your institution as a junior? Yes or No

- Intensive Dual Enrollment programs allow high school students to complete an associate degree while concurrently completing their last two years of high school. Is it at all possible for a student who has earned an associate degree from an Intensive Dual Enrollment program (associated with a regionally accredited college) to immediately matriculate as a junior into your college? Yes or No

- Does your institution accept Advanced Placement (AP) credits (assuming a minimum score or higher, set by your institution, is earned on the AP exam)? Yes, all; Most, but not all; Some; Very few; or No

- Does your institution accept International Baccalaureate (IB) credits (assuming a minimum score or higher, set by your institution, is earned on the IB exam)? Yes, all; Most, but not all; Some; Very few; or No

- Does your institution accept dual credits (on a transcript from a regionally accredited college, assuming a minimum grade or higher, set by your institution, was earned on each course)? Yes, all; Most, but not all; Some; Very few; or No

DATA COLLECTION

The survey. The refined survey wording was converted to an electronic format, and SurveyMonkey was used to create the final instrument. A link to the survey was embedded in an email and sent to the admissions counselors at the 235 universities. The email introduced the researcher and stated the purpose of the study. The introduction asked the recipient to complete the short survey, or forward the survey to the academic advisor who handles dual credit transfer.

Email addresses for the recipients of the survey at each of the 235 colleges were mined through searches of each institution's website. Admissions counselors were selected when possible. Some universities listed names and email addresses for transfer admissions counselors; other colleges simply listed one admissions email address on their website.

The college representatives who completed each survey listed their position title on the survey. Most respondents had titles such as Transfer Operations Coordinator, Assistant Director of Admissions, Transfer Credit Administrator, Registrar, Transfer Analyst, and Admissions Counselor.

The responses. The electronic survey was emailed to the 235 colleges on November 11, 2013. The email included a short introduction and summary, and a link to the electronic survey. Within three weeks of the launch date, 35 responses were collected. On December 16, 2013, a follow-up email was sent to the 200 colleges that

had not responded to the first entreaty. This second call for participation netted 28 new responses. In February of 2014, phone calls were placed to each of the colleges that had not yet responded to the survey. Only one phone call per college was attempted. An additional 34 surveys were completed over the phone and manually entered into the SurveyMonkey database by the researcher.

An analysis of the 97 responses revealed that two of the respondents emanated from the same university. Upon inspection, both of the responses listed identical answers to all of the survey questions. Hence, one of the duplicates was removed from the data summary. Six of the 97 responses in the SurveyMonkey database also showed cause for concern, as the respondents to these particular surveys failed to persist beyond the demographic section of the survey. As a result, the six responses were scrubbed from the final data.

Once the final data were converted to a single spreadsheet, several single-answer omissions were noted. Follow-up phone calls to the corresponding respondents solicited responses for each empty cell in the data spreadsheet, effectively finalizing the data set of 90 unique and complete surveys.

DATA ANALYSIS

The first question in this study is to determine whether selective universities will accept an associate degree earned through a dual credit platform. The independent variable of the research consists of the four different selectivity levels, as outlined in Barron's college selectivity index. The dependent variable of this question is simply a *yes* or *no* response from the colleges, as to whether or not it is possible for a student to

matriculate into their college as a junior if that student has earned an associate degree through an intensive dual enrollment program.

Due to the fact that the dependent variable is categorical and has only two distinct options as a response, the researcher selected logistic regression as the preferred analysis methodology. Logistic regression models a dependent variable in terms of one or more independent variables, and is particularly useful in the case of categorical dependent variables. Rather than using categorical responses, logistic regression requires the dummy coding of the responses and utilizes the log of the odds ratio of landing in a certain category for each combination of the values of the independent variables. That is, it takes the ratio of the odds in order to allow the researcher to consider the effect of the independent variable.

This odds ratio is a relative measure of effect that allows for a comparison of two independent values. In this study, the odds ratio will compare the effect of college selectivity on acceptance of credits from colleges at selectivity level 1 with that of another selectivity level. Three odds ratios will be produced for each of the hypotheses, pairing selectivity level 1 with each of the other three categories. If there is no difference in how credits transfer to the selectivity level 1 colleges compared with another selectivity level, then the ratio of the effect between the two categories will be one. If there is a difference, then the ratio will diverge from one. In the model for this study, an odds ratio larger than one indicates that the less selective colleges will accept an associate degree or the dual credits at higher rates than the most competitive colleges will accept them. Conversely, an odds ratio less than one indicates that the most selective group will accept more of the associate degrees or dual credits.

The second question of this study is to determine what amount of dual credits will transfer to a university (based upon the selectivity level of that university) if the school will not recognize the full associate degree. Logistic regression was also chosen as the statistical methodology to analyze the data for this question. The independent variable in this question is the selectivity level of the college. This is the same as that of the first question. The dependent variable for the question of dual credit transferability is the amount of dual credit that the university claimed it would accept. The college representatives were given five choices when they were asked if their institution accepts dual credits. The five responses were:

- Yes, all

- Most, but not all

- Some

- Very few

- None

Because there were only 90 respondents to the survey, the relatively small number of responses in each of the categories was a concern to the researcher. In fact, the fourth response, *Very few*, only garnered four responses from the entire sample of 90 colleges. The mean number of responses for each category was 18, since 90 responses were dispersed over five categories.

To increase the sample size of the inputs for the specific logistic regression tests that were to be run, the five responses listed above were collapses into two more general categories. The responses of *Yes, all* and *Most, but not all* were aggregated into an "All or Most" category. The three responses of *Some*, *Very Few* and *No* were combined into a

"Some to None" category for entry into the statistical software. Table 3.6 outlines the

original number of responses in each category and the number of responses in the

combined categories.   This restructuring of data provides stronger input numbers in each

cell for utilization by the statistical software. However, the collapsing of some of the

categories also has a disadvantage. Where significant results were found in the data, the

interpretations and conclusions from those results will be less specific than if the data had

not been collapsed.

Table 3.6

Creation of Two Categories of Responses from Five Responses of Survey Question #15

Selectivity	No. of Replies	Original Response Distribution					Collapsed Categories	
		Yes, all	Most, but not all	Some	Very few	No	All or Most (%)	Some to none (%)
1: MC	27	1	8	7	2	9	9 (33.3%)	18 (66.7%)
2: HCP	12	2	5	2	1	2	7 (58.3%)	5 (41.7%)
3: HC	23	6	10	6	1	0	16 (69.6%)	7 (30.4%)
4: VCP	28	13	11	3	0	1	24 (85.7%)	4 (14.3%)
Total	90	22	34	18	4	12	56 (62.2%)	34 (37.8%)

*(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive;
VCP=Very Competitive Plus)*

SASv9.4 was selected as the software program that would analyze the data. A Type I error rate of .05 was used to test for significance of the results. The SAS code that was used in this logistic regression analysis is provided in Appendix B.

Because the predictor variable in the study was categorical, the logistic regression tests required the use of dummy coding to represent the four levels of college selectivity. The most selective group, those with a selectivity index of "1," served as the reference group for the statistical tests. Since there were four total groups of selectivity rankings, there were three (k-1) different comparisons conducted in the logistic regression model.

Five different regression models were run on the body of data. They are as follows:

1.   a regression model predicting that universities at different levels of selectivity will allow students to matriculate as a junior, if the students hold an associate degree from any regionally accredited college

2.   a regression model predicting that universities at different levels of selectivity will allow students to matriculate as a junior, if the students hold an associate degree from an intensive dual enrollment program (partnered with a regionally accredited college)

3.   a regression model predicting the acceptance of AP credits, by the selectivity level of universities

4.   a regression model predicting the acceptance of IB credits, by the selectivity level of universities

5.   a regression model predicting the acceptance of dual credits, by the selectivity level of universities

CHAPTER 4

ANALYSIS OF THE DATA

Among several other advantages cited by proponents of dual credit, savings in both time and money are attractive benefits. However, if students' dually earned associate degree or dual credits do not transfer to the university of their choice, then the dual program's original allure can dissolve into little more than empty promises.

The purpose of this study is to provide an analysis of the relationship between a university's selectivity level and that university's general practices of accepting early credits from dual credit providers. Particular interest is given to the transferability of associate degrees into selective universities, when that degree was earned through an early credit provider.

This chapter will test two major null hypotheses, and will propose two alternative hypotheses.

Null Hypothesis 1 (H0₁): The level of selectivity of a university has no effect on whether or not the institution will recognize the completion of an associate degree for students who have completed their coursework at an early college.

Alternative Hypothesis 1 (H₁): The level of selectivity of a university affects whether or not the institution will recognize the completion of an associate degree for students who have completed their coursework at an early college.

Null Hypothesis 2 (H0₂): The level of selectivity of a university has no effect on the quantity of dual credits that can be transferred into that university.

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Alternative Hypothesis 2 (H$_2$): The level of selectivity of a university affects the quantity of dual credits that can be transferred into that university.

To appropriately frame the first null hypothesis for analysis, additional information was collected regarding the selective universities' practices of accepting traditionally earned associate degrees from regionally accredited colleges. A brief summary of this information will be presented in this chapter. This information will be followed by the results of the logistic regression related to selective universities' recognition of associate degrees earned through intensive dual credit programs.

The second null hypothesis, which examines the transferability of credits rather than the transferability of a degree, will be reviewed next. The transferability of early credits earned through AP programs and IB programs will also be analyzed, providing a context for comparison with that of dual credits.

RESEARCH QUESTION #1: TRANSFERABILITY OF ASSOCIATE DEGREES EARNED THROUGH INTENSIVE DUAL PROGRAMS

The researcher initiated this segment of the study with an assumption and a speculation. The assumption was that students who gained acceptance into an academically rigorous intensive dual enrollment program would likely be candidates for matriculation into selective universities. Thus the target population of this study is America's most selective universities. The speculation was that increases in the selectivity level of higher educational institutions would correspond with decreases in the institutions' willingness to recognize an associate degree from an intensive dual credit provider. The consequent null hypothesis to this speculation (H0$_1$) is that the level of selectivity of a university has no effect on whether or not the institution will recognize

the completion of an associate degree for a student who has completed his coursework at an early college.

The researcher used logistic regression tests to determine if a significant difference exists among the various selectivity levels of colleges and their recognition of associate degrees. Two different binary logistic regression models were examined. The first assessed how selective universities generally recognized associate degrees earned through any regionally accredited college. The second regression model assessed how selective universities recognized associated degrees earned through intensive dual enrollment programs.

Selective universities' acceptance of any associate degrees. Question #11 in the survey (see Appendix A) asked the question, "Does your college of university ever permit students who have earned an associate degree from a regionally accredited college or university to matriculate into your institution as a junior?" The responses were limited to "Yes" or "No." All 90 of the survey respondents completed this question. Of the 90 responses, 69 answered that it was possible for a student with an associate degree from a regionally accredited college to matriculate into the given university as a junior. The responses were disaggregated into the four selectivity levels of colleges, and their frequencies are described in Table 4.1.

Table 4.1

Possibility of Matriculation as a Junior – Any Associate Degree

Selectivity Ranking	No frequency	(percentage)	Yes frequency	(percentage)	Total
1: MC	6	(22.2%)	21	(77.7%)	27
2: HCP	3	(25.0%)	9	(75.0%)	12
3: HC	5	(21.7%)	18	(78.2%)	23
4: VCP	7	(25.0%)	21	(75.0%)	28
Total	21	(23.3%)	69	(76.6%)	90

(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

A binary logistic regression test was conducted with Type I error rate (α = .05), comparing the reference group of the category "most competitive" to the other three categories of university selectivity. The results of the logistic regression revealed that no significant difference existed among any of the pairings of the test model.

The researcher found it interesting that the percentage of "Yes" responses among all four selectivity categories fell into such a small mathematical range. That is, each of the four groups of universities answered the question affirmatively at a rate between 75 percent and 78.26 percent. This similarity of responses would not hold true when the same colleges were asked about their acceptance of dually earned associate degrees.

Selective universities' acceptance of dually earned associate degrees. Survey question #14 asked a very similar question to that of question #11. Question #14 defined

intensive dual enrollment, and inquired about the acceptance of dually earned associate

degrees. The question read, "Intensive dual enrollment programs allow high school

students to complete an associate degree while concurrently completing their last two

years of high school. Is it at all possible for a student who has earned an associate degree

from an intensive dual enrollment program (associated with a regionally accredited

college) to immediately matriculate as a junior into your college/university?"

Of the 90 respondents, only 39 responded affirmatively (compared with 69 "Yes"

responses when asked about the acceptance of any associate degree). Table 4.2 describes

the distribution of the responses to question #14, sorted by college selectivity ranking.

Table 4.2

Possibility of Matriculation as a Junior – Dually Earned Associate Degree

Selectivity Ranking	No frequency	(percentage)	Yes frequency	(percentage)	Total
1: MC	22	(81.5%)	5	(18.5%)	27
2: HCP	4	(33.3%)	8	(66.7%)	12
3: HC	14	(60.9%)	9	(39.1%)	23
4: VCP	11	(39.3%)	17	(60.7%)	28
Total	51	(56.7%)	39	(43.3%)	90

(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

The data in Table 4.2 was analyzed using binary logistic regression. The output

of this logistic regression produced maximum likelihood estimates for each category of

college selectivity. Table 4.3 displays the results of the logistic regression and a

description of the columns from Table 4.3 is provided following the table.

Table 4.3

Analysis of Maximum Likelihood Estimates for Acceptance of Dually Earned AA

Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr>ChiSq
Intercept	1	1	-1.4816	0.4954	8.9429	0.0028
Selectivity	2	1	2.1747	0.7877	7.6225	0.0058
Selectivity	3	1	1.0397	0.6542	2.5259	0.1120
Selectivity	4	1	1.9169	0.6286	9.2981	0.0023

*(Selectivity 1=MC=Most Competitive; Selectivity 2=HCP=Highly Competitive Plus;
Selectivity 3=HC=Highly Competitive; Selectivity 4=VCP=Very Competitive Plus)*

Maximum Likelihood Estimates aim to find the parameter values that make the

observed data from the sample most likely.   The *estimate* values in Table 4.3 predict the

change in the log-odds for every one-unit change in the dependent variable. The

intercept in this model represents the change in log-odds (also called the logit) at

selectivity level one, when all other values in the model are zero.   The estimate value of

1.9169 at selectivity level 4 means that for every one unit change between selectivity

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level 1 and 4, the natural log of the odds that the associate degree will be accepted by the university will increase by 1.9169.

The values listed as Standard Errors are used to compute the Wald Chi-Square values. The Wald Chi-Square is calculated by determining the ratio of the square of the estimate value and the square of the standard error value. The Wald Chi-Square is then used to determine significance at $p < .05$ level.

In this model, the data from selectivity level 1 will be compared with the data from the other three selectivity levels. Hence, three different pairings of data will be analyzed to determine if college selectivity affects the acceptance of dually earned associate degrees.

The results in Table 4.3 reveal a significant difference ($p < .05$) in the acceptance of dually earned associate degrees between college selectivity rankings 1 and 2, and between college selectivity rankings 1 and 4. Hence, the null hypothesis ($H0_1$) can be rejected in favor of the alternative hypothesis (H_1). No significant difference was discovered between selectivity rankings 1 and 3.

While finding a significant change in logit allows the researcher to reject the null hypothesis ($H0_1$), further statistical procedures are typically conducted to produce *odds ratio estimates* and *predicted probabilities*. These two outputs provide a clearer platform to describe the results of the data analysis and enhance communication of those results.

Odds Ratio Estimates for each selectivity level can be calculated by raising e (e is approximately 2.71828) to the power of the Estimate listed in Table 4.3. Table 4.4 displays the results of the odds ratio estimates among the three parings of this logistic regression analysis. Odds ratio estimates are listed in the table as Point Estimates.

Table 4.4

Odds Ratio Estimates for Survey Question #14

Effect	Point Estimate	95% Wald Confidence Limits	
Selectivity 2 vs 1	8.800	1.879	41.204
Selectivity 3 vs 1	2.828	0.785	10.196
Selectivity 4 vs 1	6.800	1.983	23.312

*(Selectivity 1=MC=Most Competitive; Selectivity 2=HCP=Highly Competitive Plus; Selectivity 3=HC=Highly Competitive; Selectivity 4=VCP=Very Competitive Plus)

The Point Estimate column in the table indicates that the odds that a level 2 college (highly competitive plus) will accept an associate degree from an IDE program are 8.8 times higher than the odds that a level 1 college will accept the degree. Additionally, the odds that a level 4 college will recognize the dual associate degree is 6.8 times higher than the odds that a selectivity level 1 school will accept an associate degree from an IDE program. The point estimate for selectivity level 3 is insignificant. The Wald Confidence Limits indicate that there is 95 percent certainty that the true population effect lies between these upper and lower limits.

Predicted Probabilities (PP) determine the likelihood that a successful event will occur. PP can be calculated using the formula $\hat{\pi} = \dfrac{1}{1 + e^{-(\hat{\beta}_0 + \hat{\beta}_1 x_1)}}$ The predicted probability that a most selective college will permit a student with an IDE associate degree to matriculate as a junior is .19, whereas the predicted probabilities that the same student will be enrolled as a junior at a highly selective plus college or at a very selective

plus college are .68 and .61, respectively. A graphical view of the predicted probabilities

for this data is provided in Figure 4.1 below.

Figure 4.1: Graph of Predicted Probabilities of Acceptance of Dually Earned Associate
Degrees

RESEARCH QUESTION #2: TRANSFERABILITY OF DUAL CREDITS

The second research question asks that if students have earned dual credits, what

quantity of credits will transfer to the selective college of their choice, and is that quantity

affected by the selectivity ranking of the college? The null hypothesis ($H0_2$) states that

the level of selectivity of a university has no effect on the quantity of dual credits that can

be transferred into that university.

To test the hypothesis, representatives from America's 235 most selective

universities were asked the following question (survey question #15): "Does your

institution accept dual credits (on a transcript from a regionally accredited college,

assuming a minimum grade or higher, set by your institution, was earned in each

course)?" The respondents were given five options, including "Yes, all," "Most, but not all," "Some," "Very few," and "No." Because the dependent variable is categorical, logistic regression was chosen as the most appropriate analysis methodology for the data.

The sample size (n=90) was relatively small, and several of the cells in the data distribution matrix contained three or less responses. Logistic regression can become problematic if some data cells have a low number of responses. As a solution, the first two response options were combined into a single category named "All or Most," and the last three response options were also collapsed into one category named "Some to None." Table 4.5 demonstrates the frequency distribution of the responses, with the five response options, and in the collapsed form with two responses.

Table 4.5

Frequency Distributions for Survey Question #15 Responses

Selectivity	No. of Replies	Original Response Distribution					Collapsed Categories	
		Yes, all	Most, but not all	Some	Very few	No	All or Most (%)	Some to none (%)
1: MC	27	1	8	7	2	9	9 (33.3%)	18 (66.7%)
2: HCP	12	2	5	2	1	2	7 (58.3%)	5 (41.7%)
3: HC	23	6	10	6	1	0	16 (69.6%)	7 (30.4%)
4: VCP	28	13	11	3	0	1	24 (85.7%)	4 (14.3%)
Total	90	22	34	18	4	12	56 (62.2%)	34 (37.8%)

*(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

The logistic regression analysis (p < .05) compared responses from the reference group (most selective universities) to each of the other three selectivity groups of universities. The test determined whether a significant difference exists between the acceptances of dual credit by selectivity level of the university.

Table 4.6 displays the Maximum Likelihood Estimates (MLE) that emerged from the analysis of the data.

Table 4.6

Analysis of Maximum Likelihood Estimates for Survey Question #15

Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr>ChiSq
Intercept		1	-0.6931	0.4082	2.8827	0.0895
Selectivity	2	1	1.0296	0.7138	2.0806	0.1492
Selectivity	3	1	1.5198	0.6099	6.2089	0.0127
Selectivity	4	1	2.4847	0.6770	13.4710	0.0002

(Selectivity 1=MC=Most Competitive; Selectivity 2=HCP=Highly Competitive Plus; Selectivity 3=HC=Highly Competitive; Selectivity 4=VCP=Very Competitive Plus)

The values in the *estimate* column represent the change in log-odds (the logit).

The *estimate* is a regression coefficient that attempts find the most likely approximation

of the parameter, based upon the data from the sample. For every one-unit change in the

independent variable (college selectivity level) the *estimate* value represents the expected

change in the natural log of the odds (the logit) of the credit acceptance rate. The

estimate value of 2.4847 at selectivity level 4 means that for every one unit change

between selectivity level 1 and 4, the natural log of the odds that the credits will be

transfer into a university at that selectivity level will increase by 2.4847.

The Wald Chi-Square figures were derived from the *estimate* and *standard error*

values, and are used to determine if college selectivity level is a significant predictor of

dual credit acceptance. In this model, data from selectivity level 1 will be compared with

the data from the other three selectivity levels. Hence, three different pairings of data

will be analyzed to determine if college selectivity affects the acceptance of dual credits.

The results in Table 4.6 reveal no significant difference ($p > .05$) in credit-

granting practices for dual enrollment courses between most competitive and highly

competitive plus universities (selectivity levels 1 and 2). However, a significant

difference does exist between selectivity levels 1 and 3, and also between selectivity

levels 1 and 4. Consequently, the second null hypothesis ($H0_2$) must be rejected in favor

of the alternative hypothesis (H_2).

Odds ratio estimates and predicted probabilities were calculated to provide

alternate ways to describe the results of the logistic regression analysis. Table 4.7

displays the odds ratio estimates among the three pairings in this particular logistic

regression analysis. The predicted odds in the table indicate that the odds that a level 3

college (highly competitive) will accept the transfer of dual credits are 4.6 times higher

than the odds that a level 1 college will accept the credits. Additionally, the odds that a

level 4 college will accept the dual credits is 12 times higher than the odds that a

selectivity level 1 college will take them.

Table 4.7

Odds Ratio Estimates for Survey Question #15

Effect	Point Estimate	95% Wald Confidence Limits	
Selectivity 2 vs 1	2.800	0.691	11.344
Selectivity 3 vs 1	4.571	1.383	15.109
Selectivity 4 vs 1	11.997	3.183	45.217

(Selectivity 1=MC=Most Competitive; Selectivity 2=HCP=Highly Competitive Plus; Selectivity 3=HC=Highly Competitive; Selectivity 4=VCP=Very Competitive Plus)

Predicted probabilities that a university at a given selectivity category would accept all or most dual credits were calculated for the reference group (most competitive) and for the two selectivity levels where significant differences exist. The predicted probability that colleges labeled as most competitive will accept all or most dual credits of an incoming freshman is .33. The predicted probabilities that the same dual credits will transfer to colleges at selectivity levels of 3 or 4 (highly competitive and very competitive plus) are .70 and .86 respectively. Figure 4.2 represents this information in graphical form.

Figure 4.2: Predicted Probabilities of Acceptance of All or Most Dual Credits

Dual Credit Acceptance Compared with AP and IB Credits. Although the primary focus of this research is directed at the transferability of dually earned associate degrees and dual credits, the researcher felt it would be interesting to solicit data that would determine whether college selectivity affected acceptance rates of college credits earned through other programs. Only AP and IB were chosen for these analyses. CLEP was not chosen, because it is offered to participants who have already finished high school (as well as students who are in high school) and the researcher wanted to maintain a focus on college credits earned by high school students.

Logistic regression analyses ($p < .05$) were conducted on the acceptance of AP credit and IB credit. College representatives responded to questions about their institutions' practices regarding acceptance of these two types of early credit (see questions 12 and 13 in Appendix A). The responses were condensed from five options to two options, similar to the treatment of the raw data from the questions that asked about the transfer of dual credit.

Appendix C contains a frequency distribution table, an odds ratio estimate table and a figure with predicted probabilities for the AP data that was collected. Appendix D contains the same tables and figure from the IB data collected from the 90 colleges.

For each of the three types of early credit (dual, AP and IB) there were no significant differences in the acceptance of early credit between colleges in selectivity levels 1 and 2. However, a significant difference existed in the acceptance of credit from each of the three early credit types when selectivity levels 1 and 3 were compared. When transfer levels of early credit from colleges at selectivity levels 1 and 4 were compared, both dual and AP revealed significant differences. IB did not. In general, transfer of AP and IB credit seem to react similarly to higher and lower college selectivity rankings, as does the transfer of dual credits. Further study in this area will be recommended in chapter 5.

One notable difference among AP, IB and dual credits surfaced during the data analysis. The predicted probabilities that a college at selectivity level 1 (most competitive) will accept all or most of a particular type of early credit were not highly similar. The predicted probability that a most competitive college will accept all or most AP credits was .70, whereas the predicted probabilities for IB and dual credit were .59 and .33, respectively.

OTHER NOTABLE FINDINGS

Included in the survey (Appendix A) were several demographic questions about the participating colleges. Two of the questions (#7 and #8) requested information about whether the college was public or private, and inquired about the number of full-time undergraduate students in the fall of 2013. The responses to these questions were not

critical to address the stated research questions in this study. They were included in the

survey, however, to provide context and possibly offer insights into subsequent research

on the topic of early credit transferability.

Public and private responses. Of the 90 respondents to the survey, 70 were

private colleges and 20 were public colleges. The total set of responses to questions

about the transferability of credits from AP (survey question #12), IB (question #13) and

dual (question #15) were collected and disaggregated into public college and private

college responses. (Table 4.8)

Table 4.8

Frequency Table for Acceptance of Early Credit Types by Public and Private Responses

	Public Colleges n=20			Private Colleges n=70		
Response	AP	IB	Dual	AP	IB	Dual
	Frequency (Percentage)			Frequency (Percentage)		
Yes, all	7 (30%)	6 (30%)	6 (30%)	34 (49%)	28 (40%)	16 (23%)
Most, but not all	10 (50%)	10 (50%)	10 (50%)	24 (34%)	24 (34%)	24 (34%)
Some	2 (10%)	3 (15%)	3 (15%)	8 (11%)	13 (19%)	15 (21%)
Very Few						4 (6%)
No	1 (5%)	1 (5%)	1 (5%)	4 (6%)	5 (7%)	11 (16%)
Total	20	20	20	70	70	70

Private colleges might possibly show preference for AP, IB and dual credit in

exactly that order. However, public colleges seem to transfer AP, IB and dual credits

with very little preference for one program over another. It should be noted that the sample size (n=20) for public colleges in this data set is quite small. Further research on the difference in early credit transfer rates among public and private colleges is recommended.

Size of college. Responses to the survey question #8 allowed for a different set of college groupings based on the undergraduate enrollment size of the universities. Colleges were asked about the enrollment of their undergraduate programs (in the fall of 2013). There were 45 colleges that stated their undergraduate programs were under 5,000 students. Another 45 colleges claimed undergraduate conscription of 5,000 or more full-time equivalents. Table 4.9 contains the results of these data.

Table 4.9

Frequency Table for Acceptance of Early Credit Types by Size of Undergraduate Enrollment

	Enrollment <5000 n=45 Frequency (Percentage)			Enrollment >5000 n=45 Frequency (Percentage)		
Response	AP	IB	Dual	AP	IB	Dual
Yes, all	19 (42.2%)	15 (33.3%)	8 (17.8%)	22 (48.9%)	19 (42.2%)	14 (31.3%)
Most, but not all	18 (35.6%)	14 (31.1%)	15 (33.3%)	18 (40.0%)	20 (44.4%)	19 (42.2%)
Some	5 (11.1%)	10 (22.2%)	10 (22.2%)	5 (11.1%)	6 (13.3%)	8 (17.8%)
Very Few			4 (8.9%)			
No	5 (11.1%)	6 (13.3%)	8 (17.8%)			4 (8.9%)
Total	45	45	45	45	45	45

The cells of Table 4.9 seem to indicate a possibility of a difference between how smaller colleges (under 5000 students) and larger colleges accept early credits. It is possible that smaller colleges are less apt to transfer early credits than larger colleges. Since public colleges are generally larger than private colleges, a difference between dual credit acceptance rates of larger and smaller colleges could be related to their public and private status. This is also an area that would be appropriate for further research.

Comparison of transferability of dually earned associate degrees with that of traditionally earned associate degrees. Survey question #11 and question #14 asked the respondent whether a student with an associate degree could possibly matriculate into their institution with junior status. Both questions stated that the transfer student's associate degree was granted from a regionally accredited college. The difference in the two questions is that question #11 referred to any associate degree and question #14 referred to a dually earned (IDE) associate degree.

The responses from the university admissions representatives seem to show stark differences in their outcomes. Figure 4.3 and Figure 4.4 show the predicted probabilities of a "yes" response for the two questions.

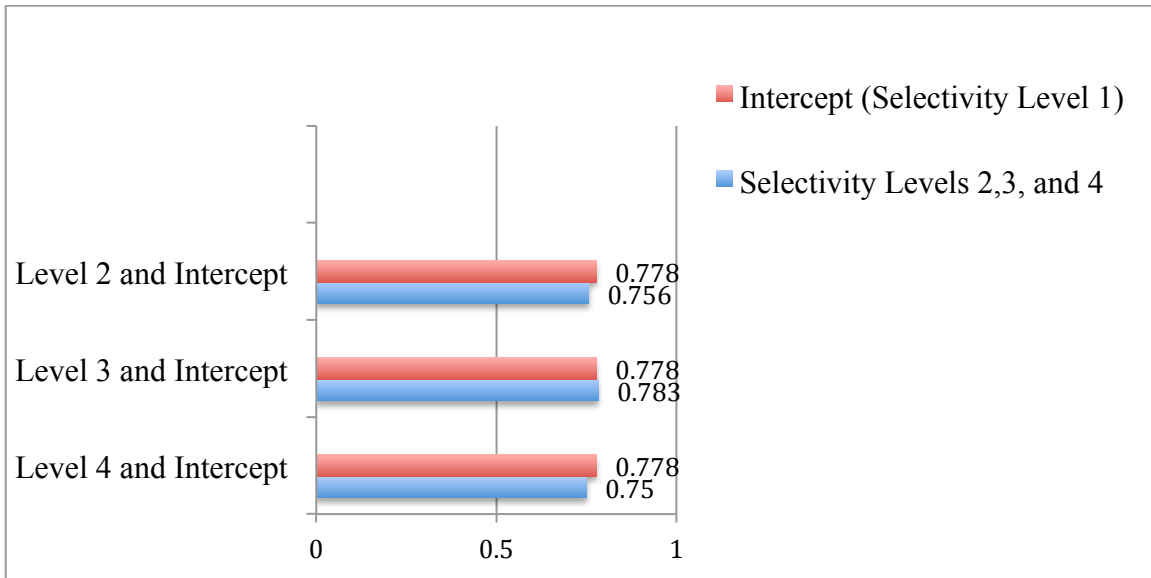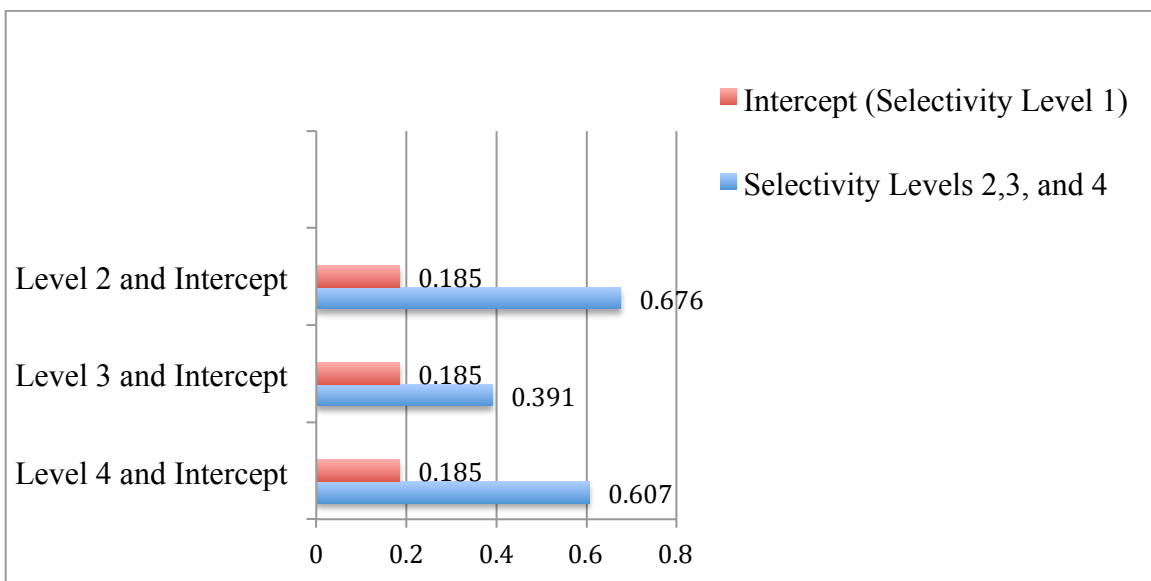Figure 4.3: Graph of Predicted Probabilities of Acceptance of Any Associate Degrees

Figure 4.4: Graph of Predicted Probabilities of Acceptance of Dually Earned Associate Degrees

The graphs above compare the predicted probabilities that the universities at various levels of selectivity will recognize an associate degree from any college (Figure 4.3) versus an intensive dual enrollment provider (Figure 4.4). Dually earned associate

degrees and traditionally earned associate degrees appear to transfer at dissimilar rates. It should be noted that even the lowest predictive probability in Figure 4.3 is higher than the highest predicted probability in Figure 4.4. This will be recommended as an area for future study in the next chapter of this research.

CHAPTER SUMMARY

This chapter presented an analysis of the data collected from the survey in Appendix A. The survey was designed to determine whether a relationship existed between the selectivity level of America's 235 most selective universities, and their level of acceptance of dually earned associate degrees and dual credits.

With regard to the acceptance of any general associate degree, no significant difference among all four selectivity levels of colleges was discovered. However, when the associate degree was earned through an intensive dual enrollment program, a significant difference in the recognition of the degree existed (between selectivity levels 1 and 2, and between levels 1 and 4). In these cases, lower ranked colleges accepted dually earned associate degrees at higher rates than that of most selective colleges.

Dual credits also transferred to the selective universities in the lower ranking tiers in significantly higher quantities than they transferred to the highest ranking schools. Universities from selectivity levels 3 and 4 showed significantly higher acceptance of dual credit than their counterparts in selectivity level 1. No significant difference was noted between colleges in selectivity levels 1 and 2.

Other notable findings included the comparison among AP, IB and dual credits with regard to the institutions from the study's four different selectivity levels. Inferences pointing toward possible further study emerged when the raw data were disaggregated into results from public and private colleges, and when the data were separated by the size of the colleges' undergraduate enrollments.

CHAPTER 5

SUMMARY, RECOMMENDATIONS AND CONCLUSION

This study provides evidence that the most competitive American colleges are not as willing to accept IDE degrees and credits as colleges with lower selectivity rankings. This chapter provides a summary of the study of the transferability of dual associate degrees and dual credits into America's most selective universities. A statement of the problem, a summary of the study, a statement of contribution to the literature, a summary of the findings, and an interpretation of the findings are presented. These statements are followed by an analysis of the implications of the study, which provide implications for school officials, parents and students, and policymakers. Recommendations for further study are presented at the end of the chapter.

STATEMENT OF PROBLEM

The enrollment target of Intensive Dual Enrollment programs consists of highly capable, secondary school upperclassmen; therefore, it is reasonable to believe that many of these precocious students will be interested in completing their undergraduate degrees at selective colleges and universities in the United States. Therefore, America's most selective universities serve as the population of the research.

Intensive dual enrollment programs attract students and parents with a promise of saving time (by entering college with at least sophomore status, and possibly junior status) and saving money through fewer years of tuition payments. However, there is no guarantee that the associate degree or the early credits earned through IDE will be

accepted by each graduate's university of choice for the completion of their undergraduate degree.

The unpredictability of the transfer of dual enrollment credits and dually earned associate degrees into higher educational institutions has been documented in the first chapter. Researchers have expressed the need for further study in this area (Heggen, 2008; Hoachlander, Stearns & Studier, 2008; Johnstone & Del Genio, 2001; Krueger, 2006; Rasch, 2002). However, this study found no research that directly examined the issue of transferability of dually earned degrees and credits.

As dual credit programs continue to propagate across the nation, and IDE programs emerge, the participants will surely desire more clarity on the expected payout of college credit at each student's university of choice. This study may serve as a germinal point of research on the relationship between college selectivity levels and dual degree/credit transferability.

SUMMARY OF THE STUDY

The transferability of credits and two-year degrees from dual enrollment programs, particularly from intensive dual enrollment programs was the primary focus of this research. The nation's 235 most selective universities served as the population for the study. Ninety of those institutions responded to a survey about their approaches to early credit transferability. This study collected information on the transfer rates of traditionally earned associate degrees, as well as those of associate degrees earned through IDE programs. The study also measured the transferability of dual credits into selective universities and offered comparisons of transfer rates within different strata of

university selectivity. The transfer rates of other forms of early credit, namely AP and IB credits, were also assessed for purposes of comparison to dual credit transferability rates.

DATA ANALYSIS

Due to the fact that the dependent variables in the research were categorical and had only two distinct options as a response, binary logistic regression was selected as the preferred analysis methodology. Logistic regression models a dependent variable in terms of one or more independent variables, and is particularly useful in the case of categorical dependent variables. Logistic regression compares two different categories of responses to estimate a most likely relationship between the independent and dependent variables. This relationship is calculated by taking the natural log of the odds ratio of landing in a certain category for each combination of the values of the independent variables. That is, it takes the ratio of the odds in order to allow the researcher to consider the effect of the independent variable.

This odds ratio is a relative measure of effect that allows for a comparison of two independent values. In this study, the odds ratio compared the effect of college selectivity on acceptance of credits from colleges at selectivity level 1 with that of the other three selectivity levels. In the model for this study, an odds ratio larger than one indicated that the less selective colleges accepted associate degrees or dual credits at higher rates than the most competitive colleges accepted them.

CONTRIBUTION TO THE LITERATURE

Specific research on the general topic of intensive dual enrollment is scarce. Additionally, research on the issue of transferability of either dually earned associate degrees or credits earned through a dual enrollment platform is almost non-existent. Yet,

the researchers cited earlier in this chapter have expressed a need for research on the issue of dual credit transferability. Hence, this study contributes to the literature by providing a first of its kind body of information regarding the relationship between the selectivity level of a college and the transferability of associate degrees and dual credits earned through IDE programs. Additionally, this study provides a comparative look at the transferability rates of dual credit with that of Advanced Placement credits and International Baccalaureate credits. As with all studies, this research has several limitations. However, this study could serve as a launch point for similar studies on the transferability of dual credit to less selective colleges, as well as provide a baseline for a more in-depth analysis of credit transfer dynamics within the ranks of selective universities.

This study provides evidence of a relationship between college selectivity ranking and the colleges' recognition of associate degrees earned through IDE programs. Higher college selectivity rankings are generally associated with a lower chance that the college will accept the IDE associate degree. The study also provides evidence that higher college selectivity rankings have a negative effect on the transfer rate of dual credits into those institutions.

SUMMARY OF FINDINGS

Transferability of associate degrees. A notable difference existed when college admissions counselors were asked about their college's acceptance of any associate degree and when they were asked about the acceptance of an IDE associate degree. Of the 90 responses from the selective colleges included in the research, 69 of them (77 percent) stated that it is possible for a student with an associate degree to transfer into

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their institution as a junior. That percentage was relatively similar across all four selectivity tiers, with most competitive at 78 percent, highly competitive plus at 75 percent, highly competitive at 78 percent, and very competitive plus at 75 percent. However, when the same colleges were asked if an associate degree earned through an IDE program would transfer into their institution, the results were quite different. Only 19 percent of the most competitive colleges indicated that they would accept the degree and grant junior status to the student. The other selectivity tiers stated acceptance rates of 67 percent, 39 percent and 61 percent respectively, with an overall acceptance rate among all four tiers of only 43 percent. The data seem to indicate that the prospect of transferring an earned associate degree into a selective university is less probable if an IDE program has granted that degree.

This research found a significant difference in the acceptance rates of IDE associate degrees between the most competitive colleges (selectivity level 1) and colleges in the highly competitive plus (selectivity level 2) and very competitive plus (selectivity level 4) groupings. Hence, IDE students who desire junior status upon their transfer should be aware that their chances of matriculation into universities with higher levels of selectivity generally drop as the selectivity ranking of the university increases.

Transferability of dual credits. If a selective university does not recognize an IDE associate degree, the graduate of the IDE program may attempt to transfer as many credits as possible into the university of their choice. Representatives from the colleges at the four different selectivity levels were asked if their institution would accept dual enrollment credits. The data gathered from the college representatives were examined through logistic regression analyses.

The cumulative result of all four selectivity levels revealed that 62 percent of the colleges indicated that they would accept *all or most* of the dual credits. Predicted probabilities that a university at a given selectivity category would accept *all or most* dual credits were calculated for all college selectivity levels in the study. The predicted probability that colleges labeled as most competitive will accept *all or most* dual credits of a transfer student is .33. The predicted probabilities that the same dual credits will transfer to colleges at selectivity levels of 2, 3 or 4 (highly competitive plus, highly competitive and very competitive plus) are .58, .70 and .86 respectively. Hence, it is reasonable to conclude that higher selectivity levels of colleges correspond with lower probabilities that the college will transfer all or most dual credits into their institution.

The difference between dual credit acceptance at selectivity levels 1 and 2 were not significant, but the differences between dual credit acceptances of selectivity levels 1 and 3, and between selectivity levels 1 and 4 were significant. The data indicate that the odds that a highly competitive (selectivity level 3) college will accept the transfer of dual credits are 4.6 times higher than the odds that a most competitive (selectivity level 1) college will accept the same credits. The odds that a very competitive plus (selectivity level 4) college will accept the dual credits are 12 times higher than the odds that a level 1 college will transfer them.

Comparison of dual credit transferability with AP and IB transferability. All three forms of early credit options in the study were similar with regard to how most selective colleges compare to other levels of selective colleges in their acceptance of early credit. Generally, higher levels of university selectivity resulted in significantly lower levels of early credit acceptance of AP, IB and dual credits.

When the three types of early credit were compared within only the top selectivity level (most competitive or level 1), the results were interesting. AP credits were found to transfer *all or most* of the time with a predicted probability of .70, while IB and dual credits transferred *all or most* of the time with predicted probabilities of .59 and .33, respectively. Students who are interested in attending a most competitive (selectivity level 1) university would benefit from an awareness of this information.

INTERPRETATION OF FINDINGS

This study was designed to serve as an initial investigation into the transferability of dually earned associate degrees and dual credits into selective universities. The study found that for each one-unit change (decrease) in college selectivity ranking, a corresponding increase in the odds of degree or credit transferability was present. In other words, lower selectivity rankings corresponded with higher rates of dual credit and dual degree transferability.

Acceptance of IDE associate degrees. The correlation described in the paragraph above (lower rankings corresponding with higher transferability) was not found, however, when college representatives described their universities' handling of an associate degree earned through traditional means. Rather there were no significant differences among any of the four selectivity levels of colleges with regard to the transferability of an associate degree earned through a traditional (non-dual) postsecondary program. In all, over three fourths of colleges surveyed in this study stated that junior status was attainable for a transfer student with an associate degree. But only 43 percent of the same colleges indicated that it would be possible for a student with an IDE associate degree to enter their college as a junior.

Selective universities in this study's sample clearly showed a preference for a traditionally earned associate degree over that of a dually earned associate degree. While this difference is noted, this study was not constructed to determine why the disparity seems to exist. An investigation into the selective universities' bias toward traditionally earned associate degrees will be listed later in this chapter as an area for further research.

Transfer of IDE credits. Similar to that of dually earned degrees, credits from IDE programs transfer differently into the four selectivity levels of universities in this study. When comparing the most selective universities with the other three selectivity levels, significant differences were found between levels 1 and 3, and between levels 1 and 4. The odds were much higher that lower ranking colleges would transfer *all or most* dual credits than that of their most competitive peers. The odds that level 3 colleges would transfer *all or most* dual credits were 4.5 times higher than level 1 colleges. Level 4 colleges had 12 times higher odds of accepting *all or most* dual credits than level 1 colleges.

The cause of the differences among the credit transfer practices of the different levels is beyond the scope of this particular research. This study set out to determine whether a difference exists; and it appears that it does. However further research will be required to determine the causality of these indicated differences in the treatment of dual credit transfer.

A consequence of these results could be that the growing number of IDE students will be attracted to colleges with lower selectivity rankings, that are more willing to accept their dually earned credits. Students who can transfer two years of college credit have a sizable financial advantage over high school graduates who do not.

Consider two high school sophomores who aspire to earn a master's degree before entering the workforce. One student finishes a traditional high school program, a four-year undergraduate program, and a two-year master's program. The other enters an IDE program. The first student finishes a master's degree eight years after the completion of the sophomore year of high school. This student will pay for six total years of college. The IDE student completes a master's degree six years after the completion of the sophomore year of high school. This student only pays for two undergraduate years and two graduate years, for a total of four years of college tuition. Two years of college room, board and tuition are saved. At $20,000 to $50,000 per year, this tuition, room and board cost savings can add to $40,000 to $100,000 in savings. Additionally, the second student enters the workforce two years earlier than the peer – resulting in two additional years of earning power. At $50,000 in salary per year, this additional earning power would amount to $100,000. The total financial advantage for the IDE student can realistically be between $140,000 and $200,000, depending upon college costs and first two years salary.

IMPLICATIONS OF FINDINGS

Recommendation to School Officials. High schools interested in starting an IDE program or schools that currently operate IDE programs should be aware of the relationship between the selectivity level of a universities and the transferability of dually earned degrees and credits. The findings of this study indicate that only 43 percent of the selective colleges are willing to recognize an associate degree earned through an IDE program. Furthermore, only 19 percent of colleges that have earned Barron's *most*

competitive ranking state that it is possible for a student with an IDE associate degree to matriculate into their institution with junior status.

School officials at IDE programs should be aware of this information and counsel current and prospective students and parents with a realistic picture of the relationship between college selectivity and dual degree and dual credit acceptance. This is not to say that students who aspire to attend a most competitive college should not attend an IDE program. Most competitive colleges seek students who have taken the most rigorous courses available to them in high school. Assuming IDE courses are considered highly rigorous, it is possible that participation in an IDE program might be looked upon favorably by the admissions offices of the most selective colleges and consequently might be beneficial in the application process. This study indicates that there are colleges at every level of selectivity that will accept dually earned degrees and dual credits. However, participants in IDE programs should be aware of the possibility of non-transferability of dual credit at the college of their choice, and know that higher levels of college selectivity correspond to significantly lower probabilities that all or most credits will transfer.

High schools that are interested in creating an early credit program with the highest rate of transferability to universities should consider developing an AP or IB program instead of a dual enrollment program. Similarly, high schools that are considering a change from one of these dual credit platforms to another should be aware that dual credit transferability is strongest for AP, and weakest for DE.

Finally, the possible financial advantages made available to IDE students are notable and potentially marketable by schools that adopt an IDE program. As stated

earlier in this chapter, a reasonable scenario for cost savings and additional earnings by an IDE student can add to more than $100,000. If the dual credits or dually earned degrees were not readily transferable, this would amount to a potentially empty promise by the IDE provider.

Recommendations for Students and Parents. Students enter an IDE program after completing their sophomore year of high school. It is possible that the IDE candidate has several universities into which they would like to eventually enroll and finish their undergraduate degree. Students should be strongly encouraged to research the particular transfer policies for dually earned associate degrees and dual credits at those institutions, before enrolling in an IDE program. Students should recognize that higher selectivity levels of colleges generally correlate with significantly lower recognition of a dually earned associate degree and also significantly lower acceptance rates of dual credits. Students who are interested in entering an IDE program should be aware that the degree and the credits they earn have no guarantee of transfer.

If students are interested in attending a *most competitive* university and would like to increase their chances of successfully transferring early credits to that institution, this research indicates that an AP program is likely to have a higher credit transfer rate than that of an intensive dual program. Also, an IB program could offer a better chance of credit transferability than that of a dual credit program, but less chance of credit transfer than that of an AP program. Predicted probabilities of acceptance of AP, IB and dual credit into colleges in the most competitive tier are .70, .59 and .33 respectively, according to this research.

The IDE platform for early credit offers a specific advantage that is worth noting. Credit bearing courses through AP and IB are typically offered to high school students in a traditional one-year-long course. That is, at the end of a full year of instruction, an AP or an IB course will potentially bear three college credits to the student who earns certain marks in class or on an end-of-year assessment. Since IDE courses are real college courses, they are generally offered by semester and potentially bear three credits at the end of each semester. For example, an AP or IB history course will generally produce three possible college credits in one academic year, while one year of history through a dual platform will commonly produce six total credits (three college credits for each semester). Although this research suggests that IDE credits transfer to selective colleges at lower rates than credits from AP and IB programs, it is still possible that IDE students transfer a greater net number of credits into selective colleges due to the fact that dual platforms produce a higher potential for earned credits than that of AP and IB.

A final implication that is worth consideration is that students who are capable of being accepted at *most selective* universities will possibly be drawn to lower ranking universities so that the students' dually earned associate degree or dual credits will transfer. Assuming lower ranked colleges are more apt to offer junior status to students with IDE associate degrees, it is reasonable that students would be attracted to the savings of time and money offered to them by less selective colleges, and forgo acceptances from more selective colleges.

Recommendations for Policymakers. State policymakers have little control over private education, but have full governance authority over the entire student pathway from a public high school through a public baccalaureate degree. As IDE

partnerships emerge in public educational settings, it seems reasonable for state policymakers to develop well-articulated rules about the transferability of degrees and credits for students who stay within the realm of publicly funded education.

This type of articulation agreement would require cooperation among three different educational institutions: the high school involved in the dual credit offerings, the college that provides the actual dual courses and grants the associate degree to the IDE student, and the college that eventually allows the IDE students to transfer into their institution as a junior. The researcher believes that this type of articulation agreement between secondary education and higher education produced predictability related to degree transfer and is quite likely the key to IDE growth and success in the state of Florida. The researcher also believes that the compelling value proposition of IDE programs (time savings and cost savings) will serve as a strong impetus for future growth of IDE programs throughout the nation.

RECOMMENDATIONS FOR FURTHER STUDY

This study provides an initial framework to the question of transferability of dually earned associate degrees and dual college credits. Further study is recommended, stemming from several facets of this research.

- Future studies could expand the population of universities to include institutions at lower selectivity levels. The current study only included the top five percent of all higher educational institutions in the United States. It would be informative and interesting to conduct a similar study, which analyzes transferability practices of strong colleges that are still outside the most elite groupings used in this study.

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- The analysis of the transfer of associate degrees revealed an interesting dynamic. Over three fourths of all colleges surveyed in this study stated that it is possible for a student with an associate degree to matriculate into their college as a junior. However, only 43 percent of the same colleges indicated that it was possible for a student with an associate degree from an IDE program to matriculate as a junior. Clearly, there is a difference in how the dually earned associate degrees are perceived by selective universities. Research to determine why an IDE degree is looked upon with less favorability is recommended.

- Intensive dual enrollment providers are always a result of partnering high schools and colleges. The colleges happen to be the credit-granting and degree-granting entities in the relationship. It is therefore recommended that further research be conducted to determine whether the strength of the college in the IDE partnership has any bearing on the level of transferability of their credits or their degrees into selective universities. There are relatively strong universities (such as Syracuse University, University of Florida, and University of Connecticut) that offer dual and intensive dual programs. It would be informative to determine whether dual credits offered through their programs are accepted at selective universities at higher rates than dual credits offered through a standard community college.

- While enrollment size of the college was not originally designed to be an independent variable, it appears that the size of the college might have some impact on whether or not the college accepts dual credits or degrees from IDE programs. The sample in this study contained 45 colleges with enrollments under 5,000, and 45 colleges with enrollments greater or equal to 5,000. A cursory look

at the data from these two different groups within the sample seems to suggest

that smaller colleges might be less apt to accept dual credits or dually earned

degrees. However, the proper statistical tests and analyses would need to be

conducted.

- Similar to that of college enrollment size, another study is recommended that

  would focus on the difference between public colleges and private colleges in the

  acceptance of dual credit. Only 20 public colleges participated in this study.

  Therefore, generalizations about public colleges, which stem from proper

  statistical tests, would most likely require a much larger sample size. However,

  the researcher noted that public colleges in the study seemed to treat AP, IB, and

  dual credit transfer rather similarly. Private colleges showed more variability in

  their treatment of the three types of early credit. Almost half (49 percent) of the

  private colleges in the sample indicated that they would accept *all* AP credits,

  whereas only 23 percent of the same colleges said they would accept *all* dual

  credits. It should be noted that larger colleges tend to be public, while private

  colleges tend to be private. Hence, proper controls for these two variables would

  be necessary to determine the precise effect of each.

- The researcher recommends the creation of a web-based clearinghouse of

  information related to the transferability of all forms of early credit into all higher

  educational institutions. Currently, students earning any form of early credit can

  search individual university websites to determine that university's policies for

  acceptance or transfer of associate degrees and early credits. The development of

  one collective source for this information would be immensely valuable to IDE

students, as well as students who are taking AP or IB courses. The clearinghouse website could include information about college acceptance policies of IDE degrees, DE credits, AP credits, IB credits, CLEP courses, and also include information about the maximum number of transfer credits permitted by specific colleges.

FINAL STATEMENTS

Considering the escalating costs of higher education and the national attention to college debt, the time saving and cost saving value proposition of IDE will certainly hold substantial appeal to many parents and students. The researcher speculates that families from middle and lower income homes have a particularly high interest in the cost savings benefit of IDE.

While parent and student interest in IDE could grow considerably in the near future, awareness and interest from universities would also need to grow for IDE programs to thrive. This research indicates that some selective colleges are more willing to accept IDE degrees and credits than other selective universities. Why this dynamic occurs is a question of interest. It is possible that the universities do not believe that 18-year-old IDE graduates have the life experiences required to take junior level courses. It is also possible that selective universities believe there is something unique or superior about their own freshmen and sophomore experiences that is needed for student success as upperclassmen at their institution. The researcher also notes that colleges seem to benefit financially from larger, lecture hall style courses taught primarily to underclassmen, and probably lose money on courses offered to upperclassmen with smaller class sizes. Hence, colleges have a financial incentive to enroll students who will

take courses as both underclassmen and upperclassmen, rather than IDE students who are applying for immediate junior status. Furthermore, selective universities are surely interested in guarding the strong reputations they have crafted over decades or even centuries. The structure of IDE programs offers a two-fold disincentive to the admissions offices at selective universities. That is, the IDE classes are 1.) delivered to high school aged students and 2.) the IDE credits are most often granted through community colleges. These two elements of IDE programs could give pause to highly selective universities that are intent on guarding their reputations and status.

In addition to the speculative statements above, it seems that selective universities do not currently believe that the most capable students in America are graduating from IDE programs. The researcher speculates that the most selective colleges in the nation are highly interested in simply matriculating the best and the brightest students into their institutions, and would be more amenable to transfer IDE degrees and credits if the colleges felt that the nation's best students graduated from IDE programs.

This study provides evidence that the most selective American colleges are not as willing to accept IDE degrees and credits as colleges with lower selectivity rankings. IDE graduates are therefore faced with an incentive to possibly attend less selective universities that are more apt to recognize the associate degree the students have earned.

The researcher recognized that today's students who aspire acceptance at the most competitive universities in America are probably not the best candidates for an IDE program. However, the researcher also recognizes the strong value proposition that IDE offers to students who are open to finishing their undergraduate degrees at colleges with slightly lower levels of selectivity.

The researcher has developed an IDE program that will begin at his school in

August of 2015. It is his hope that in just a few years, the town's police department will

be complaining about the traffic caused by his school's open house.

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The following survey was used to collect data for the research. The survey was created in SurveyMonkey and a link to the survey was sent by email to the appropriate representatives from each college in the population of the study. .

Dual Credit Transferability

General Information

Thank you for your contribution to this timely and important research.

Please answer each of the following questions to the best of your knowledge. The entire survey should take between five and seven minutes to complete.

1. Name of college or university:

2. State:
Select state

3. Name of person completing survey:

4. Your position at college or university:

5. Your email address:

6. Phone number: ext:

Describe the university

7. Public or Private:

- o Public
- o Private

8. What is the number of full-time, undergraduate students for the Fall of 2013?

- o Less than 1,000
- o 1,001 – 5,000
- o 5,001 – 10,000
- o 10,001 – 20,000
- o Over 20,000

9. Does the college/university have a current religious affiliation?

- o Yes
- o No

10. What is the in-state tuition rate for freshman in the Fall of 2013?

- o Under $10,000
- o $10,001 - $20,000
- o $20,001 - $30,000
- o Above $30,000

Credit Transfer Policies

At most colleges and universities, several variables can affect the transferability of credits earned from other institutions. When responding to the following questions, please consider the most typical scenario at your institution, and select the response that best describes general practice.

11. Does your college or university ever permit students who have earned an associate's degree from a regionally accredited college or university to matriculate into your institution as a junior?

- o Yes
- o No

12. Does your institution accept Advanced Placement (AP) credits (assuming a minimum score or higher, set by your institution, is earned on the AP exam)?

- o Yes, all
- o Most, but not all
- o Some
- o Very few
- o No

13. Does your institution accept International Baccalaureate (IB) credits (assuming a minimum score or higher, set by your institution, was earned in each course)?

- o Yes, all
- o Most, but not all
- o Some
- o Very few
- o No

14. Intensive Dual Enrollment programs allow high school students to complete an associate's degree while concurrently completing their last two years of high school. Is it at all possible for a student who has earned an associate's degree from an Intensive Dual Enrollment program (associated with a regionally accredited college) to immediately matriculate as a junior into your college/university?

- o Yes
- o No

15. Does your institution accept dual credits (on a transcript from a regionally accredited college, assuming a minimum grade or higher, set by your institution, was earned in each course)?

- o Yes, all
- o Most, but not all
- o Some
- o Very few
- o No

16. Is your college/university bound by any specific state policy or policies regarding the transfer of dual credit?

- o Yes
- o No

17. In your opinion, which best expresses the trend of your college/university's position on the transferability of dual credit over the next three years?

- o Trending to accept more dual credits
- o Trending to accept less dual credits
- o Dual credit acceptance seems as if it will remain fairly constant with current practices

Powered by **SurveyMonkey**
Check out our sample survey and create your own now

APPENDIX B – SAS CODE

```
options nodate nonumber;
libname BM 'E:\Brian Modarelli Dissertation\';

ods listing;
ods html close;
ods graphics off;

**Importing the Excel spreadsheet**;
proc import out=work.bm_dis
      datafile = "E:\Brian Modarelli Dissertation\BM Dissertation.xls"
    dbms = XLS replace;
      sheet="Sheet1";
      getnames = YES;
      mixed = NO;
run;
proc contents data=work.bm_dis; run;

*Running basic frequencies for descriptive statistics*;
ods rtf style=SansPrinter;
Proc Freq data=work.bm_dis;
Tables q7 q8 q9 q10 q11 q12 q13 q14 q15 q16 q17;
Title 'General Frequencies of all Items';
run;
Proc Freq data=work.bm_dis;
tables q11*selectivity q12*selectivity q13*selectivity q14*selectivity
q15*selectivity;
title 'Crosstabs of Items 11 through 15 by Selectivity Index';
run;
ods rtf close;

**Renaming variables to make them numeric - this will help in general
with the analysis and has to be done
to run logistic regression**;
Data cleandata_bmdis;
set work.bm_dis;
If q11='Yes' then q11=1;
If q11='No' then q11=0;
If q12='Yes, all' then q12=5;
If q12='Most, but not all' then q12=4;
If q12='Some' then q12=3;
If q12='Very few' then q12=2;
If q12='No' then q12=1;
If q13='Yes, all' then q13=5;
If q13='Most, but not all' then q13=4;
If q13='Some' then q13=3;
If q13='Very few' then q13=2;
If q13='No' then q13=1;
If q14='Yes' then q14=1;
```

```
If q14='No' then q14=0;
If q15='Yes, all' then q15=5;
If q15='Most, but not all' then q15=4;
If q15='Some' then q15=3;
If q15='Very few' then q15=2;
If q15='No' then q15=1;


ADegree=q11+0;
q12n=q12+0;
q13n=q13+0;
DualEnroll=q14+0;
q15n=q15+0;
run;


*Running frequency tables to make sure data was coded correctly*;
Proc Freq data=cleandata_bmdis;
tables ADegree*selectivity q12n*selectivity q13n*selectivity
DualEnroll*selectivity q15n*selectivity;
run;
Proc Freq data=work.bm_dis;
tables q11*selectivity q12*selectivity q13*selectivity q14*selectivity
q15*selectivity;
run;


*Combining response categories for q12,q13, and q15 to run logistic
regression - combining "yes" and "most, but not all" into
an overall "Yes" category and combining "Some", "Very few", and "No"
into an overall "Some/No" category*;
Data combine_bmdis;
set cleandata_bmdis;
If q12n >=4 then q12n2=1;
If q12n <=3 then q12n2=0;
If q13n >=4 then q13n2=1;
If q13n <=3 then q13n2=0;
If q15n >=4 then q15n2=1;
If q15n <=3 then q15n2=0;
APcredit=q12n2+0;
IBcredit=q13n2+0;
Dualcredit=q15n2+0;
run;


Proc Format;
      value response
      1='Yes - Most'
      0='Some - None';
run;


*Running contingency tables*;
ods rtf style=SansPrinter;
proc freq data=combine_bmdis;
table APcredit*selectivity IBcredit*selectivity Dualcredit*selectivity;
format APcredit IBcredit Dualcredit response.;
title 'Crosstabs of Items 12, 13, and 15 after grouping response
categories together';
run;
ods rtf close;
```

```
*Exporting a finalized and clean dataset*;
Data bm.final_bmdis;
set combine_bmdis;
run;



*Running the logistic regression procedures*;
ods rtf style=SansPrinter;
proc logistic data=bm.final_bmdis descending;
      class selectivity (ref='1')/param=ref;
      model ADegree = selectivity / rsq expb;
      title 'Logistic Regression Predicting Associates Degree/Junior
Matriculation (yes) from Selectivity';
run;
proc logistic data=bm.final_bmdis descending;
      class selectivity (ref='1')/param=ref;
      model APcredit = selectivity / rsq expb;
      title 'Logistic Regression Predicting AP Credit (yes) from
Selectivity';
run;
proc logistic data=bm.final_bmdis descending;
      class selectivity (ref='1')/param=ref;
      model IBcredit = selectivity / rsq expb;
      title 'Logistic Regression Predicting IB Credit (yes) from
Selectivity';
run;
proc logistic data=bm.final_bmdis descending;
      class selectivity (ref='1')/param=ref;
      model DualEnroll = selectivity / rsq expb;
      title 'Logistic Regression Predicting Intensive Dual
Enrollment/Junior Status (yes) from Selectivity';
run;
proc logistic data=bm.final_bmdis descending;
      class selectivity (ref='1')/param=ref;
      model Dualcredit = selectivity / rsq expb;
      title 'Logistic Regression Predicting Dual Credit (yes) from
Selectivity';
run;
ods rtf close;
```

APPENDIX C – AP DISTRIBUTION TABLE, ODDS RATIOS

AND PREDICTED PROBABILITIES

Table C.1

Frequency Distributions for AP Credit Transferability

Selectivity	No. of Replies	All Five Response Options					Collapsed Options	
		Yes, all	Most, but not all	Some	Very few	No	All or Most (%)	Some to none (%)
1: MC	27	10	9	5	0	3	19 (70.4%)	8 (29.6%)
2: HCP	12	4	4	3	0	1	8 (66.7%)	4 (33.3%)
3: HC	23	9	13	1	0	0	22 (95.7%)	1 (4.3%)
4: VCP	28	18	8	1	0	1	26 (92.9%)	2 (7.1%)
Total	90	41	34	10	0	5	75 (83.3%)	15 (16.7%)

*(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

The following table contains the results of the regression predicting the acceptance of AP Credit by Selectivity

Table C.2

Regression Results for AP Credit by Selectivity

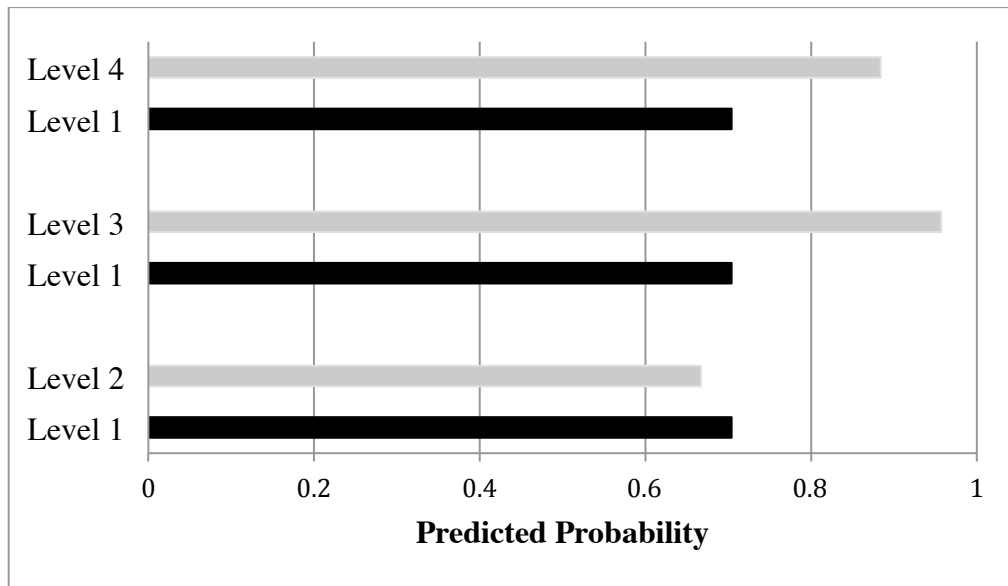|	Estimate	p-value	Predicted Log Odds $(logit(\pi))$	Predicted Odds $(e^{logit(\pi)})$	Predicted Probability $\left(\dfrac{1}{1 + e^{-logit(\pi)}}\right)$
Intercept	0.865	0.040			0.704[a]
Selectivity2	-0.172	0.817	0.0693	0.842	0.667
Selectivity3	2.226	0.044*	3.091	9.263	0.956
Selectivity4	1.70	0.045*	2.035	5.474	0.884

*p<.05

Figure C.1 Graph of Predicted Probabilities of Transfer of AP Credits by Selectivity

APPENDIX D – IB DISTRIBUTION TABLE, ODDS RATIOS AND PREDICTED PROBABLITIES

Table D.1

Frequency Distributions for IB Credit Transferability

Selectivity	No. of Replies	All Five Response Options					Collapsed Options	
		Yes, all	Most, but not all	Some	Very few	No	All or Most (%)	Some to none (%)
1: MC	27	7	9	7	0	4	16 (59.3%)	11 (40.7%)
2: HCP	12	5	3	3	0	1	8 (66.7%)	4 (33.3%)
3: HC	23	6	15	2	0	0	21 (91.3%)	2 (8.7%)
4: VCP	28	16	7	4	0	1	23 (82.1%)	5 (17.9%)
Total	90	34	34	16	0	6	68 (75.5%)	22 (24.5%)

(MC=Most Competitive; HCP=Highly Competitive Plus; HC=Highly Competitive; VCP=Very Competitive Plus)

The following table contains the results of the regression predicting the acceptance of IB Credit by Selectivity

Table D.2

Regression Results for IB Credit by Selectivity

	Estimate	p-value	Predicted Log Odds $(logit(\pi))$	Predicted Odds $(e^{logit(\pi)})$	Predicted Probability $\left(\frac{1}{1+e^{-logit(\pi)}}\right)$
Intercept	0.375	0.339			.593[a]
Selectivity2	0.318	0.661	0.693	1.375	.667
Selectivity3	1.977	0.018*	2.351	7.219	.913
Selectivity4	1.151	0.068	1.526	3.162	.821

*p < .05

[a]The intercept represents universities at Selectivity Level 1. This value is the predicted probability for those universities
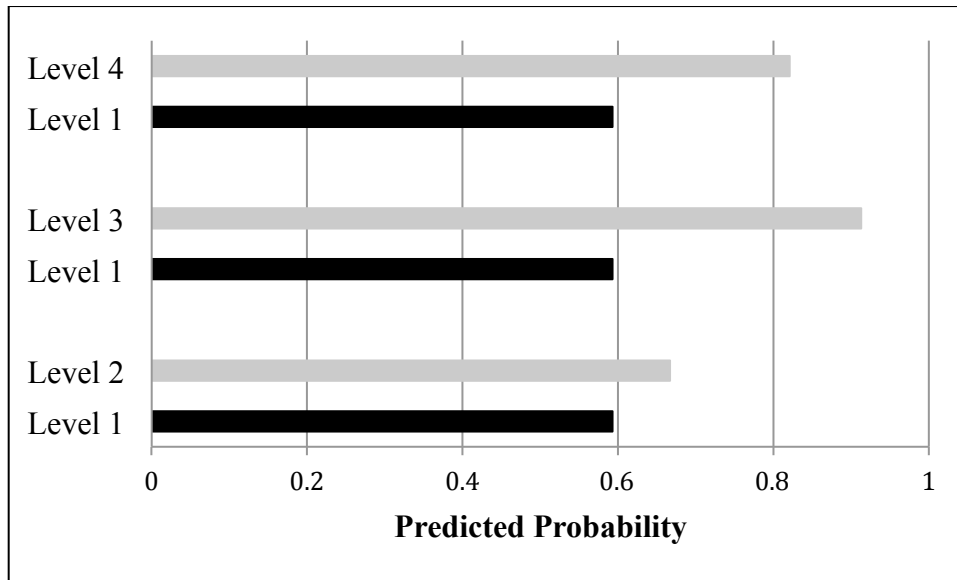

Figure D.1 Graph of Predicted Probabilities for Transfer of IB Credit by Selectivity

APPENDIX E – COLLEGES IN POPULATION AND SAMPLE

The following are lists of the four categories of Barron's Selectivity Index.

Colleges in bold participated in the study.

Most Competitive (Selectivity Level 1)

Amherst College

Barnard College

Bates College

Boston College

Bowdoin College

Brandeis University

Brown University

Bryn Mawr College

Bucknell University

California Institute of Technology

Carleton College

Carnegie Mellon University

Case Western Reserve University

Claremont McKenna College

Colby College

Colgate University

College of the Holy Cross

College of William and Mary
Columbia University in the City of New York
Connecticut College
Cooper Union for the Advancement of Science and Art
Cornell University
Dartmouth College
Davidson College
Duke University
Emory University
Franklin and Marshall College
George Washington University
Georgetown University
Hamilton College
Harvard University
Harvey Mudd College
Haverford College
Johns Hopkins University
Kenyon College
Lafayette College
Lehigh University
Macalester College
Massachusetts Institute of Technology
Middlebury College
New York University
Northwestern University
Oberlin College

Occidental College

Pomona College

Princeton University

Reed College

Rensselaer Polytechnic Institute

Rice University

Rose-Hulman Institute of Technology

Scripps College

Stanford University

Swarthmore College

The College of New Jersey

Tufts University

Tulane University of Louisiana

United States Air Force Academy

United States Military Academy

United States Naval Academy

University of California-Los Angeles

University of Chicago

University of Miami

University of North Carolina at Chapel Hill

University of Notre Dame

University of Pennsylvania

University of Richmond

University of Rochester

University of Southern California

University of Virginia-Main Campus

Vanderbilt University

Vassar College

Villanova University

Wake Forest University

Washington and Lee University

Washington University in St Louis

Webb Institute

Wellesley College

Wesleyan University

Whitman College

Williams College

Yale University

Highly Competitive Plus (Selectivity Level 2)

American University

Bard College

Beloit College

Boston University

Centre College

Colorado College

Denison University

Dickinson College

Furman University

Georgia Institute of Technology-Main Campus

Gettysburg College

Grove City College

Hendrix College

Hillsdale College

Illinois Institute of Technology

Illinois Wesleyan University

Knox College

Lawrence University

Mount Holyoke College

New College of Florida

Rhodes College

Skidmore College

Smith College

St. John's College

St. Olaf College

SUNY at Binghamton

SUNY at Geneseo

The New School

Thomas Aquinas College

Trinity University

University of California-Berkeley

University of Illinois at Urbana-Champaign

University of Michigan-Ann Arbor

University of Wisconsin-Madison

Wheaton College

Worcester Polytechnic Institute

Highly Competitive (Selectivity Level 3)

Agnes Scott College

Augustana College

Austin College

Babson College

Baylor University

Bennington College

Bentley College

Chapman University

Clark University

Clemson University

Colorado School of Mines

Elon University

Emerson College

Fordham University

Gonzaga University

Grinnell College

Gustavus Adolphus College

Hampshire College

Jewish Theological Seminary of America

Kalamazoo College

Kettering University

Loyola College in Maryland

Loyola University Chicago

Loyola University New Orleans

Lyon College

Marquette University

Milwaukee School of Engineering

Muhlenberg College

New Mexico Institute of Mining and Technology

Northeastern University

Ohio State University-Main Campus

Pepperdine University

Pitzer College

Providence College

Quinnipiac University

Ramapo College of New Jersey

Rollins College

Rutgers University-New Brunswick

Santa Clara University

Sarah Lawrence College

Sewanee: The University of the South

Southern Methodist University

Southwestern University

St John's College

St Lawrence University

St Mary's College of Maryland

Stevens Institute of Technology

Stony Brook University

Syracuse University

Texas A & M University
Texas Christian University
The University of Texas at Austin
The University of Texas at Dallas
Trinity College
Union College
United States Coast Guard Academy
United States Merchant Marine Academy
University of California-Irvine
University of California-San Diego
University of California-Santa Barbara
University of Connecticut
University of Florida
University of Georgia
University of Maryland-College Park
University of Minnesota-Twin Cities
University of Pittsburgh-Pittsburgh Campus
University of Puget Sound
University of San Diego
University of Tulsa
Virginia Polytechnic Institute and State University
Westmont College
Wheaton College
Wofford College

Very Competitive Plus (Selectivity Level 4)

Allegheny College

Bard College at Simon's Rock

Berea College

Berry College

Butler University

Calvin College

Cedarville University

City University of New York/Baruch College

College of the Atlantic

College of the Ozarks

College of Wooster

Cornell College

Creighton University

Drake University

Earlham College

Hanover College

Hope College

Houghton College

Indiana University Bloomington

King College

Lake Forest College

Miami University

Millsaps College

Missouri University of Science and Technology

Pacific Union College

Richard Stockton College of New Jersey

Rochester Institute of Technology

Saint Louis University

Salem College

Shimer College

Stonehill College

Susquehanna University

Taylor University

Truman State University

University at Buffalo/State University of New York

University of Central Florida

University of Dallas

University of Delaware

University of Denver

University of South Carolina at Columbia

University of South Florida

University of Tennessee at Knoxville

University of the Pacific

Ursinus College

Willamette University