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Academic Success Indicators Associated with Immediate Postsecondary Enrollment

Alexandria C. Johns

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Academic Success Indicators Associated with Immediate Postsecondary Enrollment

by

ALEXANDRIA C. JOHNS

Dissertation presented to the
Faculty of the Graduate School of Education at
Seattle Pacific University
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy in Counselor Education

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February 2019
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Abstract

The primary aim of this study was to examine the predictive relationship between human capital academic success indicators and student enrollment or non-enrollment in a postsecondary institution or program. For this study, the researcher analyzed academic records, demographic information, and National Student Clearinghouse (NSC) reports from two comprehensive high schools in one school district to address the research question. A direct logistic regression was used to examine the predictors that influenced the decision of high school graduates from the class of 2017 to enroll in a two-year college, technical college, four-year college, or non-enrollment immediately after graduation from high school. Three predictor variables contributed to the odds of increasing postsecondary enrollment: high school attended, cumulative GPA, and math credit above Algebra Two; and one predictor variable contributed to decreasing the odds of postsecondary enrollment: FAFSA completion. This study yielded postsecondary enrollment information for one local school district that can lead to promising school district policy and practice changes which may enable educators in their assistance and guidance of students toward immediate post-high school plans.

Keywords: immediate postsecondary enrollment, human capital, high school, logistic regression
Chapter One: Introduction

Postsecondary education is a human capital investment for students across race, gender (Becker & Murphy, 2007), and socioeconomic status (SES) (Belasco, 2013). There are long-term economic incentives for students to enroll in postsecondary educational programs such as “students who enroll in college immediately after high school are more likely to receive greater economic return over time…” (Rowan-Kenyon, 2007, p.191). Postsecondary education has become an important part of gaining career opportunities for adults (Hill, 2008). President Obama’s administration set the current tone for postsecondary enrollment by establishing a goal that by 2020, the United States of America would once again have the highest percentage of college graduates in the world (White House Office of the Press Secretary, 2009). Administrators in high schools, school districts, and states have been encouraged to review the systems and policies in place to increase student enrollment in postsecondary institutions (Engberg & Wolniak, 2010).

Researchers have suggested that the majority of future jobs will require people with postsecondary education from a two-year, technical, or four-year college (Boggs, Elsner, & Irwin, 2017; Georgetown Public Policy Institute, 2013; Pike, Hansen, & Childress, 2014). Continued research on postsecondary enrollment yields information to stakeholders (e.g. educators, parents, school leaders, legislatures, etc.) about how K-12 educators are preparing students for either postsecondary education or the work place. Educators can use results from this study to determine which human capital academic success indicators are contributing to students’ immediate postsecondary enrollment.
Theories Associated with Postsecondary Enrollment

Researchers found that cultural and social capital theories influence student’s college choice while human capital theory influences a student’s enrollment decision (Engberg & Wolniak, 2010, 2014; Perna, 2006; Rowan-Kenyon, 2007). Human capital theory is the economic theory of investment in a population's education, training, and overall well-being (Adamson, 2009; Becker, 1962, 1994; Marginson, 2016). At the forefront of this theory, as applied to education, Becker (1962, 1994) predicted that as an individual continues with education and training, expected lifetime earnings increase. Human capital theory therefore ties postsecondary education and employment together, as career training and education are needed to secure a job (Marginson, 2016). Cultural capital is an assortment of characteristics (e.g. language, societal knowledge, and behaviors) that a student usually learns from their parents (Engberg & Wolniak, 2010; Perna, 2006; Rowan-Kenyon, 2007). A student’s postsecondary enrollment can be impacted by a parent’s experience or understanding of postsecondary education. Social capital is connected with resources accessible to students through their social networks (Engberg & Wolniak, 2010; Perna, 2006; Rowan-Kenyon, 2007). Similarly, a student’s postsecondary educational opportunities are impacted by social network influences. In both the case of social and cultural capital, parents and peers educational background influences a students’ understanding of postsecondary planning (Engberg & Wolniak, 2010; Perna, 2006; Rowan-Kenyon, 2007).

College Enrollment

An individual’s choice to pursue postsecondary education can affect lifetime income distribution and, therefore, impact an individual’s poverty status as the individual
may need education in order to obtain or advance in a career (Mincer, 1958; Rowan-Kenyon, 2007). Jobs of the future will require an individual to acquire a postsecondary degree or certificate to compete in the changing global market (Boggs, Elsner, & Irwin, 2017; Georgetown Public Policy Institute, 2013; Pike, Hansen, & Childress, 2014). The Bureau of Labor Statistics (BLS) (2017a) reported that as of “October 2016, 69.7 percent of 2016 high school graduates were enrolled in colleges or universities” (para. 1). One might argue that if the United States is going to continue to be a part of the global market, a well-trained workforce is imperative (Boggs et al., 2017; Pike et al., 2014) therefore, postsecondary enrollment greater than 69.7% will be needed to meet the workforce demands (Boggs et al., 2017; Pike et al., 2014). Furthermore, the increase of postsecondary enrollment is important to the economic health of the United States due to the correlation exists between unemployment and years of post-high school education or training (Pike et al., 2014). Researchers Pike et al. (2014) confirmed a common assumption in the United States that the higher the level of post high school education or training, the less likely a person will be unemployed.

Decreased degree attainment leads to higher unemployment and lower wages as more and more careers require a degree or certificate (BLS, 2017b; Boggs et al., 2017; Georgetown Public Policy Institute, 2013; Pike et al., 2014). Becker and Murphy’s (2007) conclusion that "growth in the education level of the population has been a significant source of rising wages, productivity, and living standards over the past century" (p. 21) was supported by BLS (2017a, 2017b) reports, showing further evidence for the need to increase postsecondary enrollment and degree or certificate attainment.
College Readiness Defined

College readiness is a focus of American educators. Throughout the history of publicly funded education, teachers, administrators, schools, and school districts have been held accountable for preparing students to not only meet basic academic standards, but also for preparation for life after high school. Recent education reform has prepared students to be eligible for enrollment in postsecondary education (Conley, 2015). In addition, educators have been preparing and assisting students and their families to navigate the postsecondary enrollment process (Hill, 2008). Research has shown that there are lifetime earnings advantages to completing postsecondary education (Center for Analysis of Postsecondary Education and Employment [CAPSEE], 2017; Rothman, 2012). This body of research lends support for an increased educational focus on college readiness.

Although the focus of this study and review of literature are on college readiness, it should be noted that college and career readiness are often studied in conjunction with one another. A review of studies on college and career readiness revealed that the terms college readiness and career readiness have been used interchangeably (Conley & McGaughy, 2012; Education Policy Improvement Center [EPIC], 2012). EPIC (2012) defined college and career readiness as:

A student who is ready for college and career [and] can qualify for and succeed in entry-level, credit-bearing college courses leading to a baccalaureate or certificate, or career pathway-oriented training programs without the need for remedial or developmental coursework. (p. 1)

High school students are required to disclose their college readiness through the
submission of a variety of evidence to be considered for acceptance to postsecondary institutions. For example, when a student applies to a postsecondary institution, be it a two-year, technical, or four-year college, the student is required to submit standardized test scores to determine college readiness (e.g. the ACT, Smarter Balanced Assessment [SBA], and the SAT). In addition to submitting a student’s high school transcript and test data as evidence for college readiness, an activities log, showing participation in extracurricular activities, is required as part of the four-year college application.

No Child Left Behind (NCLB) assumes all students have equal opportunity and knowledge regarding postsecondary planning, and also assumes they all have the same academic needs. Many students assume that a four-year baccalaureate college degree is the next step after high school graduation, and students often enroll in a baccalaureate four-year college academically unprepared, with no plan of study, and no idea what it takes to be successful in college (Barnes & Slate, 2013). Students who achieve a passing score on the SBA, which students take in accordance with Every Student Succeeds Act (ESSA) mandates, are deemed college ready based on their performance on cognitive factors, specifically English Language Arts and math (SBAC, n.d.). Unfortunately, there is less emphasis on the non-cognitive factors of education (e.g. communication capabilities, technology proficiency, flexibility, initiative, and adaptability), which are also necessary components required for student success in postsecondary educational programs (Association for Career and Technical Education [ACTE], 2010; Conley, 2008; Conley & French, 2014; Conley & McLaughy, 2012).
Other Key Terms Defined

For this study, the researcher used the following working definitions related to postsecondary enrollment.

**Associate’s degree:** The Office of Federal Student Aid (n.d.-b), refers to an Associate’s degree as “an undergraduate academic degree granted after completion of two years of study. Community colleges and career colleges generally award associate degrees” (para. 10).

**Bachelor’s degree:** The Office of Federal Student Aid (n.d.-b) refers to Bachelors’ degree as “an undergraduate academic degree awarded for a course of study that generally lasts four years. Colleges or universities generally award Bachelor's degrees” (para, 15).

**Four-year college:** any college offering a Bachelor’s (or above) degree upon successful achievement of a course of study, which typically takes four or more years (Office of Federal Student Aid, n.d.-a).

**Immediate postsecondary enrollment:** matriculation into a two-year, technical, or four-year college program for the fall quarter, directly following high school graduation.

**Non-enrollment:** a student’s choice not to enroll in a two-year or four-year college program during the fall quarter, directly following high school graduation.

**Postsecondary education and training programs:** “refers to any formal setting in which an individual pursues additional instruction beyond high school” (EPIC, 2012, p.1).

**Technical college:** A technical, vocational, or trade school teaches the knowledge
and skills needed for an occupation; which can culminate in an Associate’s degree or certificate (Office of Federal Student Aid, n.d.-a).

**Two-year college:** Two-year college, often referred to as community, technical, or junior colleges, are any college where an Associate’s degree (which take about two, but less than four years to earn) and certificate are awarded (Office of Federal Student Aid, n.d.-a).

**Purpose of the Study**

The researcher used data from a school district in Washington State, approximately 25 miles north of Seattle. The body of research initially examined was done to review post high school planning curriculum. Through this research, it became evident that the body of data available was too old and needed to be updated. This data included academic records, demographic information, and National Student Clearinghouse [NSC] (n.d.) reports for the school district. The sample was limited to students who graduated in 2017 from the two comprehensive high schools in the selected school district. Students from the alternative high school in the selected school district were not included due to the low number of graduates (< 75).

Human capital academic success indicators and demographic data were traditionally gathered by school registrars and reported to the Federal Government in compliance with Department of Education accountability requirements, which continued to be requirement of ESSA. Prior researchers found that measures of demographic characteristics (e.g. socioeconomic status, race/ethnicity, and gender) and human capital academic success indicators (e.g. college readiness, academic achievement) influenced the decision of high school graduates to enroll in college immediately following
graduation (Engberg & Wolniak, 2010, 2014; Rowan-Kenyon, 2007). Examining and reporting on student data are important to help improve district policy formation and school practices. School districts currently collect human capital academic success factors and demographic data annually.

According to research findings, the high school academic success factors leading to college enrollment and success were students’ grade point average (GPA), enrollment in advanced courses, and student performance on standardized tests (Camara, 2013; Engberg & Wolniak, 2010, 2014; Pike et al., 2014; Rowan-Kenyon, 2007).

Postsecondary enrollment is often expensive. Therefore, many students rely on college loans, federal and state grants, and/or scholarships to finance their postsecondary training (Adamson, 2009). Free Application for Federal Student Aid (FAFSA) completion has been positively linked with college enrollment (Perna, 2006) as the completion of this application gives students access to state and federal grants or loans as well as college awarded scholarships. Demographic data (e.g. socio-economic status, College Bound Scholarship (CBS) enrollment, race, gender, and high school attended) serve as non-cognitive factors in students’ decisions to enroll in a postsecondary institution immediately following high school graduation.

The researcher used a direct logistic regression to examine the predictors that may influence the decision of high school graduates to enroll in a two-year college, technical college, four-year college, or non-enrollment immediately after graduation from high school.

**Significance of the Study**

The human capital variables identified in research completed by Engberg and
Wolniak (2010, 2014) and Rowan-Kenyon (2007) were the components used for research purposes in the current study. This research study was focused on the 2017 high school graduate student data from the two comprehensive high schools in the same school district. Data included updated postsecondary enrollment information for the local school district graduates. The researcher examined the human capital variables (e.g. high school academic success factors and FAFSA completion) that were associated with a student’s decision to enroll or not enroll in postsecondary institutions immediately following high school graduation. The study also explored the relationship between students’ demographic factors such as race, free and reduced-price lunch enrollment, CBS designation, gender, high school attended, and students’ decision to immediately enroll in postsecondary training. According to prior research, the aforementioned factors influenced students’ decisions to enroll in postsecondary education and training directly after high school graduation (Becker & Murphy, 2007; Belasco, 2013; Engberg & Wolniak, 2010, 2014; Pike et al., 2014; Rowan-Kenyon, 2007). This researcher included the same human capital factors used in previous research in order to determine if the factors were still relevant with updated data.

In order to help students succeed after graduation from high school, educators should be able to identify predictive variables that lead students to postsecondary enrollment. Predictive variables provide educators with an opportunity to implement appropriate and relevant interventions to support students and assist them with preparation for postsecondary enrollment. A curriculum or intervention that will assist students with postsecondary success (Pike et al., 2014), and attempt to remove barriers present in the educational system, is necessary for positive student outcomes.
Engberg and Wolniak (2010, 2014), Hill (2008), and Rowan-Kenyon (2007) have utilized data from the National Education Longitudinal Study (NELS) or Educational Longitudinal Study (ELS) to investigate college enrollment. When these researchers reviewed national data, the results represented nationwide outcomes, which were valuable but may not expose the impacts of state or local policies. Specific rules and policies in a school district or state may have an impact on local research results. For example, in Washington State, Algebra One, Geometry, and a third year of math are required for graduation from high school (Office of Superintendent of Instruction [OSPI], n.d.) and may influence postsecondary placement and course eligibility.

Research Question and Null Hypothesis

Individual success indicators related to a student’s decision to enroll in a postsecondary institution immediately following high school graduation can be measured as individual values. This study addressed the following question and null hypothesis involving human capital academic success indicators.

Research Question

Which human capital academic success indicators best predict student postsecondary enrollment immediately following high school graduation in one school district located in the northwest region of Washington State?

Null Hypothesis

The likelihood that a high school graduate will enroll in a postsecondary institution immediately following high school graduation is not related to the high school a student attended, students’ race, gender, CBS enrollment, Free or Reduced Priced Lunch (FRPL) enrollment, high school Grade Point Average (GPA), number of
Advanced Placement (AP) courses taken in high school, number of math credits earned above Algebra Two, Smarter Balanced Assessment (SBA) English Language Arts (ELA) scale score, and students’ Free Application for Federal Student Aid (FAFSA) completion status.

Summary

This chapter discussed the introductory elements of the dissertation study, including the background, problem statement, and purpose of the study. The subsequent sections of this dissertation are divided into four chapters. The literature that informed this study is encompassed in Chapter Two. Chapter Three describes the methodology for the study. Chapter Four discusses the findings of this study. Chapter Five addresses the interpretation and discussion of the results, a discussion of the limitations, implications for future studies, and conclusions of this study.
Chapter Two: Literature Review

In many high schools, students are required to self-report their post-high school plans to school staff. School district officials neither track nor report what happens to their graduates after students leave the K-12 system. Due to the lack of data analysis on students’ post-high school plans, school district officials are unable to accurately identify reported variables that impact a students’ decision to enroll in postsecondary institutions. Furthermore, without data on graduates’ post-high school decisions, educators in schools and school districts are unable to identify needs in their student populations. It is important for K-12 educators to identify post-graduate trends in order to incorporate them into future goals or areas of focus and policy change for a school or school district. The focus on postsecondary education and training program enrollment stems from the body of evidence that shows that individuals with the greatest number of years of education/training have the lowest rate of unemployment (Pike et al., 2014).

In order to address the research question, the researcher examined literature for multiple interpretations and definitions of college and high school success. The following literature review provided the theoretical basis for the identified factors that may influence the likelihood of postsecondary enrollment.

**Theoretical Framework**

Human capital theory, social capital theory, and cultural capital theory have been used as a framework for the examination of the factors that impact a high school student’s decision to immediately enroll in postsecondary training. While there are infinite ways to define and examine human behavior, particularly that of youth, this literature review and subsequent study focused on factors defined through the human
capital theory. It should be noted that in much of the literature reviewed for the current study, researchers determined cultural and social capital predictors should be used in tandem with human capital to determine the predictors of college enrollment (Engberg & Wolniak, 2010, 2014; Rowan-Kenyon, 2007). Cultural and social capital indicators were not collected by schools as they are not mandated data points from the Federal Government.

**Human Capital**

Becker (1994), through the lens of an economist, theorized that education and training improved human capital in the sense that one cannot "separate a person from his or her knowledge, skills, health, or values" (p. 16). By investing in basic foundational education (e.g. elementary, middle, and high school education), one is prepared to enter postsecondary educational institutions, ideally begin a program with no remedial education, and potentially earn a certificate and/or a degree; which then leads to higher lifetime income (Becker, 1994; Hill, 2008). Marginson (2016) stated that the “investment in education is a function of lifetime earnings” (p. 169). Those without postsecondary training may not be prepared for jobs, and would therefore be paid less (Becker, 1994).

Human capital is knowledge a person possesses, which cannot be separated from the individual (Adamson, 2009; Becker, 1962, 1994). An example of human capital is an earned degree or certificate (e.g. a high school diploma, an Associate’s degree, or a Bachelor’s degree). Experience and knowledge gained through training become a permanent asset to the individual. In human capital theory, it is assumed that an education will result in the individual being productive, and that the individual’s productivity will determine earnings (Adamson, 2009; Becker, 1962, 1994; Marginson, 2016).
Human capital affects whether a student is prepared for and enrolls in postsecondary educational programs following high school graduation (Marginson, 2016). Enrollment in postsecondary education (two-year, technical, or four-year college) is a person’s investment in their own human capital; essentially their marketable skills and knowledge. Skills and knowledge gained during one’s postsecondary education reduces unemployment and increases occupational status (Becker, 1962; Rowan-Kenyon, 2007). After graduating from high school, students must decide whether to begin working, usually at a job that requires less skills and pre-training, or to continue to invest in their human capital by enrolling in a postsecondary institution, which will enhance future earnings (Becker, 1994).

Education is an investment in the intellectual human capital of the United States population (Becker, 1962, 1994; Kiker, 1966). Americans have invested heavily in educating the population from kindergarten through grade 12 by dictating basic educational standards (e.g. Common Core State Standards) and outcomes necessary for all American youth to earn not only a high school diploma, but also to enter postsecondary educational institutions ready for the next level of learning (Kiker, 1966). Most recently in 2015, the Obama Administration enacted the ESSA, a reauthorization of the Elementary and Secondary Education Act (ESEA) which was previously reauthorized as the NCLB Act of 2002. Some of the changes ESSA made to ESEA and NCLB included adding a college and career readiness focus, providing pre-K education for students, and giving states the task to enforce student performance targets; including school rating and accountability measures, interventions and supports for struggling schools (US Department of Education, n.d.).
Engberg and Wolniak (2010, 2014) and Rowan-Kenyon (2007) applied multinomial logistic regressions to test human, social, and cultural capital effects on college enrollment decisions by utilizing national data from the Educational Longitudinal Study (ELS) 2002 and National Education Longitudinal Study (NELS) 1988-2000 (Engberg & Wolniak used ELS 2002 data and Rowan-Kenyon used NELS 1988-2000 data). Engberg and Wolniak and Rowan-Kenyon studied the effects of human capital on college enrollment; indicators included the total number of AP classes completed, high school grade point average (GPA) attained, and highest level of mathematics courses completed. These researchers found that the three human capital predictors of typical high school success showed alignment with two-year, technical and four-year college enrollment. Engberg and Wolniak and Rowan-Kenyon concluded that postsecondary academic preparation and achievement in high school are the strongest human capital predictors of college enrollment. This finding supported the continued use of these factors in predicting college enrollment, because these definitions provided educators with a framework for post high school planning curriculum.

**Cultural Capital**

Cultural capital is defined as a range of attributes (e.g. language, societal knowledge, and behaviors) that a student usually acquires from parents (Engberg & Wolniak, 2010; Perna, 2006; Rowan-Kenyon, 2007). Rowan-Kenyon (2007) suggested that cultural capital measurements “can include parental expectations; peer encouragement; parental involvement with the school; amount of educational materials in the home; and participation in art, music, or dance classes" (p. 195). Thus, parental influence is a significant motivator in a student’s decision to enroll in a postsecondary
Rowan-Kenyon found that parental involvement had a positive impact on a student’s decision to enroll in a postsecondary institution immediately following high school graduation. A parent’s educational attainment appeared to influence students’ beliefs regarding the value of postsecondary education (Perna, 2016). Notably, parental understanding and value of postsecondary educational opportunities and processes are valuable data when looking at the postsecondary enrollment decisions of students.

**Social Capital**

Social capital is associated with the resources available to students through their social networks (Engberg & Wolniak, 2010; Perna, 2006; Rowan-Kenyon, 2007). Rowan-Kenyon (2007) measured social capital data as “information about financial aid, closed networks, parental involvement with the student’s education, teacher-student relations, high-school based support, high school control, and school participation in the free and reduced lunch program" (p. 195). Peer networks were important social capital indicators for students’ decisions (Engberg & Wolniak, 2010; Palardy, 2013). Palardy (2013) found that students with peers who desired to attend college are more likely to enroll in a two-year college; students who had friends who dropped out of high school were less likely to graduate from high school themselves. Similar to parental education and value of postsecondary educational opportunities and processes, peer influence on a students’ postsecondary enrollment decision is noteworthy data.

**Human, Cultural, and Social Capital**

The measurement data for both social and cultural capital, as defined by Rowan-Kenyon (2007), are often difficult to collect in K-12 education. Cultural and social capital indicators are usually not collected or stored by schools. The human capital variables
used in this study were related to students’ perceived abilities included the measurements of high school academic success (GPA, advanced course work, highest level of math, total number of AP courses, and standardized test scores). These data points are available to high school educators through district access to student information systems.

**College Enrollment**

Belasco (2013), Engberg and Wolniak (2010, 2014), and Rowan-Kenyon (2007) found that high school academic success was associated with college enrollment. It is essential to know how many graduates enroll into postsecondary institutions immediately following high school graduation as opposed to those who do not, given the current focus of American educators is on postsecondary plans and enrollment (i.e. college readiness).

Belasco (2013) examined the impact of school counselors’ college-related informational visits on a student’s likelihood of enrolling at a postsecondary institution. Belasco used student data from ELS reports on 2005 graduates. Belasco disaggregated socioeconomic status (SES) student information and school counselors’ college-related informational visit with students and investigated the potential impact on their postsecondary enrollment. Student-level variables used for Belasco’s study included demographic, SES characteristics, Grade Point Average (GPA), standardized assessment scores, higher math course completed, and postsecondary expectations. School context variables included school control, student-to-teacher ratio, percentage of graduates attending four-year college, and the average SES of students.

Belasco (2013) tested the independent variable of students visiting their school counselor for college-related information in 10th and 12th grades using coarsened exact matching (CEM), and later a generalized linear model, to identify significant student-
level and school-context predictors of postsecondary enrollment. Belasco categorized the data as visited in both grades, one grade only, or never. Data reported as one grade only may not have given enough information to the researcher as it was unknown which single grade level made an impact. Had Belasco used more categorized college visits, for example 10th grade, 12th grade, or never, and allowed students to check multiple boxes, this feature might have enabled the researcher to determine the impact of counselor visits at different grade levels. Counselor visits in 10th grade provide an opportunity for students to plan for postsecondary options. Counselor visit in 12th grade were primarily for postsecondary enrollment processes, as students were close to exiting high school; whereas in 10th grade, educators were able to intervene when there is no stated postsecondary enrollment plan. Since Belasco was ultimately looking for predictors of postsecondary enrollment, a multinomial logistic regression may have been better for statistical analysis, with postsecondary enrollment as the dependent variable and the number of school counselor visits, student-level and school-context as the independent predictive variables.

The results of Belasco’s (2013) study indicated that students with a higher GPA, higher-level math courses completed, and higher standardized test scores were more likely to enroll at four-year colleges, as opposed to two-year college enrollment or no enrollment. Students with higher SES were more likely than students with low-SES to enroll at a postsecondary institution. Belasco also found, after controlling for influential college going variables, race was related to postsecondary enrollment. A few school-context variables were also influential on students’ decisions to enroll at a postsecondary institution. A school’s mean SES and percentage of the high school graduates attending a
four-year institution were positively associated with the likelihood a student would enroll in postsecondary education. Belasco found that low-SES students benefited from visiting with their school counselor about college-related information. Low-SES students who visited college campuses with their counselor during both 10th and 12th grade were more likely to enroll at a four-year institution, as opposed to non-enrollment or enrollment at a two-year institution.

The importance of Belasco’s (2013) study is that college-related visits with a school counselor, GPA, higher-level math course completion, standardized test scores, race, the percentage of students attending four-year colleges and a high school’s mean SES all had positive impacts on the likelihood of a student enrolling at a four-year institution. It is important for educators to know that students benefit from meeting with their counselors as early as 10th grade to initiate the discussion around post high school plans. One particular limitation to Belasco’s study was that data about the school counselor ratios were not included. Analyzing the student-to-counselor ratio may have had an impact on the number of times a student was able to access their counselor for discussions about postsecondary enrollment options.

Researchers Engberg and Wolniak (2010) examined how students’ attainment of human, social, and cultural capital, at both the individual and school levels, impacted postsecondary enrollment. The study drew from the ELS data (2002), whose participants graduated from high school in the spring of 2004. An update to this study with data representative of today’s graduate is warranted. Updated high school graduate data may confirm that the same variables are still significant predictors of college enrollment. A limitation of this study was that Engberg and Wolniak did not use FAFSA completion
data, instead, the researchers used parent’s perceived ability to pay for college. An additional limitation of this study was that the researchers focused on the parents’ plan but not the students’ perceived ability to pay for college.

Using a multinomial logistic regression, Engberg and Wolniak (2010) tested individual and school level variables to determine if they were predictors of two-year, four-year, or non-enrollment at postsecondary institutions. Engberg and Wolniak found that as SES increased, the likelihood that a student would enroll in a postsecondary institution increased. High achievement and GPA also increased the likelihood that a student would enroll in a postsecondary institution, however the impact was stronger for four-year college enrollment. Additionally, the findings from this study suggested that parent and peer networks increased the odds of enrollment at a four-year institution. These results yielded a continued pattern of predictive postsecondary enrollment variables.

Engberg and Wolniak (2014) further investigated the predictive influence of the SES of the high school population on college enrollment human, social, and cultural capital factors. Engberg and Wolniak again used the ELS of 2002 which consisted of high school graduates from the class of 2004. The use of the same data from their previous study was a limitation, as the use of updated information would assist with the validation that their variables were still predictive of college enrollment. Another limitation of this study was the comparison of the different schools based on SES. The researchers grouped schools as low-, mid- and high- SES based on the percentage of students enrolled in FRPL program, household income, parent educational attainment, and parent occupation. Engberg and Wolniak did not control for location (rural, urban, or
suburban) nor size of the school when categorizing the SES type of the school, meaning
the researchers may have characterized schools that are not similar, other than SES,
within the same category. Further subcategorization of schools by location and size
would provide researchers with the opportunity recreate studies with greater accuracy.
Additionally, the use of students’ FRPL enrollment as an indicator of the school level
SES was a limitation. FRPL enrollment is optional and though the information is
accessible to researchers and school district personnel, information can be incomplete as
not all eligible students are enrolled in the program (Musu-Gillette, 2016).

The multinomial dependent variable Engberg and Wolniak (2014) used was
enrollment classifications, defined as two-year enrollment, four-year enrollment, and no-
enrollment. Engberg and Wolniak employed a mix of demographic (gender and race) and
SES variables (SES index including ELS data and FRPL) for the independent variables in
the study. In addition to demographic and SES data, Engberg and Wolniak (2014) used
human (number of AP courses taken, students GPA, and highest level of mathematics
achievement in high school), cultural (family and close friends aspirational intensity, and
frequency that a student was involved in a cultural activity with a parent) and social
(parents’ involvement in school-based organizations, and the extent to which the parent
knew the student) capital constructs. School-level variables such as aggregation of each
construct at the school level, and school-level controls were also used to test their theory.

Engberg and Wolniak (2014) utilized an instrument design using a principal axis
factor analysis with Varimax rotation to determine which factors led to college
enrollment. The results indicated that students at high-SES schools were significantly
more likely than students at low-SES and middle-SES schools to enroll at four-year
colleges. On the contrary, students at low-SES and middle-SES schools were more likely than students at high-SES schools to enroll at a two-year college. The descriptive statistics showed that white students constituted the majority of students at high-SES schools while Black and Hispanic students made up only a small portion of the high-SES schools, thus race may not have had as great of an impact as SES. Students attending high-SES schools had a higher average academic profile than students at low- and middle-SES schools. The significance of Engberg and Wolniak’s (2014) results were that the SES of the school, as a whole, had an impact on students’ preparedness and decision to enroll in college. Educators employed at low- and middle-SES schools can use factors discovered in similar studies, with updated data, to challenge their students to become academically prepared for postsecondary enrollment. These staff members must have access to resources which assist students with their post high school plans.

Another factor in a student’s decision to participate in postsecondary education is the timing of their decision to enroll. Rowan-Kenyon (2007) investigated the reasons behind students’ decisions to delay college enrollment. Using human, social, and cultural capital constructs, Rowan-Kenyon explored the predictors of delayed college enrollment. The study drew on data from the NELS: 1992-2000, from which participants graduated from high school in the spring of 1992. Descriptive and multinomial logistic regression analyses were used to determine students’ enrollment status from various points of data collection. The initial data collection happened while students were in high school between 1988 and 1992, and follow up data were collected in 1992, 1994, and 2000.

Rowan-Kenyon (2007) found that 68% of graduates from 1992 enrolled in college immediately following high school graduation, with 17% of graduates delaying
enrollment (enrolling within eight years of graduation), and 14% of the 1992 graduates not enrolling in college by 2000 (eight years after high school graduation). The results further revealed that graduates who delayed enrollment or did not enroll had weaker academic preparation, especially in math, and lower achievement on standardized tests than those that chose to enroll in college immediately following high school graduation. Rowan-Kenyon also found that students with higher SES were more likely to enroll or delay enrollment in college rather than not enroll.

The significance of Rowan-Kenyon’s (2007) results were that academic preparation, achievement, and SES had an impact on the odds that a student would enroll either immediately after or within eight years of high school graduation, or not enroll in a postsecondary institution. Rowan-Kenyon’s (2007) study used data from students who graduated from high school in 1992, collected 1992, 1994, and 2000; thus an update to this study is warranted to check that the same predictors of delayed college enrollment are still valid. Use of data within five years of graduation date would lend greater relatability to the study. A noteworthy limitation Rowan-Kenyon’s study was that it did not include student postsecondary degree completion and the analysis. Though the researcher focused solely on the timing of students’ enrollment in a postsecondary institution, the question of whether or not a student completed a degree should have been included for analysis. The answer to that question may have had additional implications regarding when a student should enroll in a postsecondary institution and the advice the educators should give to students on when to enroll in a postsecondary institution.

**College Costs**

The United States government has invested heavily in citizens’ knowledge and
skills, i.e. human capital, through K-12 public school funding laws and policies such as Elementary Secondary Education Act (ESEA), No Child Left Behind (NCLB), Common Core State Standards (CCSS) and Every Student Succeeds Act (ESSA) which regulate content taught in K-12 public school institutions. Postsecondary education imposes financial responsibility on the student and family. It can become expensive to cover all the costs associated with attending a postsecondary institution. For students to invest in their own education after high school graduation, they typically request financial aid which is granted on the form of loans, grants, work study programs and scholarships. When securing loans for postsecondary education, the borrower is essentially signing a human capital contract, agreeing to return portions of their potential future income to investors in the form of loan repayment and interest fees on the loan (Adamson, 2009). Many schools and programs have attempted to assist students with this burden by awarding scholarships based on merit, determined by indicators such as GPA and test scores. Researchers have found that the cost of continuing education post-high school is an integral factor in a student’s decision to enroll or not to enroll in postsecondary education (Beattie, 2002). Engberg and Wolniak (2010) found that greater parental concern about paying for college was associated with decreased likelihood of a student enrolling in a four-year college.

The availability of financial aid has been positively linked with college enrollment (Perna, 2006). The FAFSA application is used by postsecondary institutions to award financial aid to students. Financial aid awards include academic or need based grants, subsidized or unsubsidized loans, and scholarships or work study (Office of Federal Student Aid, n.d.-c). Student access and school use of FAFSA data need careful
examination to determine whether or not the SES of a school, the training of a counselor or student background indicators, contribute to a student’s FAFSA completion.

The cost of postsecondary training and education can be classified as direct (tuition, fees, and books) and indirect (transportation, childcare, not working, and personal expenses) (Becker, 1962). One can infer that costs involved in postsecondary education can be a barrier to enrollment, or can delay enrollment, in postsecondary educational institutions. In Washington State, the CBS program, established in 2007 by the Washington State Legislature, provides state funding to low-income students for postsecondary enrollment. For educators, who may not have access to student SES data, student CBS enrollment is a background factor that assists educators in the identification of low-SES students. Parents must register their student for the CBS program in the seventh or eighth grade, and the student must maintain eligibility (e.g. low-income, graduate from a Washington State high school with a minimum of a 2.0 GPA, and file the FAFSA or the Washington Application for Federal Student Aid [WASFA]) at the time of graduation to receive funds, and enroll in a Washington State postsecondary institution (Washington Student Achievement Council [WSAC], n.d.). This program is promoted by middle school counselors who continue to actively recruit student enrollment and participation.

In an effort to increase postsecondary enrollment for Washington State students attending Washington State institutions, the CBS program has removed some of the barriers of paying for postsecondary education for enrolled students. A legislative report (WSAC, 2017) stated that CBS student postsecondary enrollment decreased from 67% in 2013 to 61% in 2016. However, the raw number of CBS students enrolling in
postsecondary institutions was at a slightly higher rate than non-CBS high school graduates in Washington State (WSAC, 2017). More research on the impact of CBS is warranted to help understand reasons for the decrease in enrollment in postsecondary institutions and the difference in postsecondary enrollment between non-CBS and CBS high school graduates.

**Socioeconomic Status**

Traditional studies have defined and measured SES as family income, parental education, and parental occupation (American Psychological Association [APA], 2018; Engberg & Wolniak 2010, 2014). School districts often do not have access to parental income information, level of parental education, or occupational information, resulting in school districts and states need to rely upon FRPL enrollment information as an indicator for SES (Engberg & Wolniak, 2010; Musu-Gillette, 2016). Many researchers have used FRPL information and have found that students with higher SES were more likely to enroll in a two or four-year college (Belasco, 2013; Cabrera & La Nasa, 2000; Coca, Nagaoka, & Seeskin, 2017; Engberg & Wolniak, 2010; Rowan-Kenyon, 2007). For example, Belasco (2013) found that a school's mean SES and the percentage of alumni attending four-year institutions were key factors that impacted students’ enrollment in postsecondary educational institutions. Consequently, SES has played an important role for consideration when examining college enrollment.

**Enrollment Timing**

In addition to financial constraints, timing of college enrollment is also an important factor. Rowan-Kenyon (2007) found that 68% of graduates in 1992 enrolled immediately following high school graduation, 17% delayed enrollment, and 14% had
not enrolled in college eight years after graduation. Parent-student conversations about education have been found to increase the likelihood that a student would enroll during the fall after high school graduation (Engberg and Wolniak 2010, 2014; Perna, 2006; Perna & Titus, 2005). Most of the studies available did not reflect high school graduates from the last five years, thus, the replication of these studies to reflect today’s graduate is necessary. Studying multiple demographic and social variables of current high school students who enroll in postsecondary educational programs immediately following high school graduation enables educators to identify students who are not on the path toward immediate postsecondary enrollment. Educators can then intervene with college readiness programming to ensure that all students have access to multiple options after high school graduation, regardless of their decision to enroll.

Belasco (2013) found similar results and concluded that students with higher academic ability and achievement (higher GPA, high standardized test scores, and completion of high-level math courses) were more likely to enroll in postsecondary educational institutions. College-related resources, an aspect of the high school environment, can direct students away from two-year colleges, which could result in delayed or non-enrollment at a postsecondary institution (Hill, 2008). Pike et al. (2014), Hill (2008), and Belasco’s (2013) research synthesized and presented to high school educators could have enormous impact on students’ future enrollment in postsecondary institutions. Educators’ knowledge and understanding of the risk factors for a student to not enroll in postsecondary training gives them an opportunity to intervene before the student enters 12th grade.

Pike et al. (2014) investigated four clusters of pre-matriculation variables related
to student success. With the use of a logistic regression, Pike et al. (2014) subcategorized high school factors into four clusters that not only led to students’ postsecondary enrollment, but also contributed to students’ successfully earning a postsecondary degree. Factors affecting high school students as determined by these researchers were: first generation status of college students, family income, college entrance exam scores (e.g. ACT and SAT scores), high school course work, cumulative grade point average, class rank, extracurricular involvement, and initial full-time postsecondary institution enrollment (Pike et al., 2014). An important limitation to Pike et al.’s research was that their study focused on enrollment and degree completion at four-year Baccalaureate institutions. Students that enrolled at a two-year institution and then transferred to a four-year institution to complete their degree might have impacted the degree completion results reported by. An additional limitation to Pike et al.’s research was that students’ high school experiences and students’ expectations for college data were based on the ACT Compass survey, indicating that participants were prepping to enter a four-year institution. Students that did not consider themselves college bound might have a greater likelihood of not participating in the ACT Compass survey.

**School Characteristics**

In contrast to individual characteristics of students as discussed in a previous section, the characteristics of a school (e.g. the SES make-up of the school and the resources available within the school) impact a student’s decision to enroll at a postsecondary institution (Coca et al., 2017; Engberg & Wolniak, 2014; Palardy, 2013; Perna, 2006). Narrowly focused research reports such as Coca et al. (2017), which focused solely on Chicago Public School graduates, yielded the need to expand
researchers’ understanding of the impact of school characteristics on postsecondary enrollment nationwide. Using data from the 2002 ELS study, which was representative of 2004 high school graduates, Palardy (2013) surmised that the socio-economic composition of a high school and the resources available to students attending the high school had an impact on students’ high school graduation and college enrollment rates. Characteristics of the school, such as basic demographic and SES data, should be examined in equal measure with individual student characteristics when educators plan programs to increase opportunities for students to immediately enroll in postsecondary training.

Researchers found that the type of school and the supports available at the school impacted a student’s decision to enroll in a postsecondary institution (Coca et al., 2017; Hill, 2008; Palardy, 2013). Hill (2008) researched the effects schools had on students’ decisions to enroll at a postsecondary institution. Hill (2008) used data from the High School Effectiveness Study (HSES) to analyze different types of college-linking strategies used by high schools. The HSES addressed relationships between high schools and students’ characteristics. Individual student level data from the National Education Longitudinal Study (NELS: 88-94), administered to students between 1988 and 1994, was matched to HSES participants. Hill’s study used data from students that graduated in 1992. Many educational policies (Common Core State Standards) and Laws (NCLB) that were designed to assist low-SES and non-white students succeed in K-12, had been put into place before Hill completed her study. The dependent variable that Hill used was college enrollment status, which consisted of three categories (not enrolled in college, enrolled at a two-year institution, and enrolled at a four-year institution). The independent
student level variables consisted of race, parent’s highest level of education, parent’s income, gender, academic achievement, GPA, and family-based college planning resources. Hill operationalized college-linking practices that schools use into four categories: encouraging college visits, assisting with financial aid applications, assisting with college applications and contacting college representatives on behalf of the student. Hill also measured other school characteristics which included school context and composition.

Results from Hill’s (2008) study suggested that students’ GPA and the schools’ SES had an impact on the likelihood that a student would enroll in a two-year or four-year institution as opposed not to enrolling in either. Hill also found a positive relationship between a student’s decision to enroll at a four-year institution and parental education attainment. The results were noteworthy as Hill was able to identify three types of college-linking strategies used by high schools as traditional, clearinghouse and brokering. High schools which implemented a traditional college-linking strategy provided few, if any, college resources to students and their families. High schools which implemented a clearinghouse college-linking strategy provided college resources to students but lacked college enrollment assistance systems to help students and families navigate the process. High schools implementing a brokering college-linking strategy provided structures and resources to students and their families throughout the college application/enrollment process. A limitation to Hill’s study was that the focus was solely on two- and four-year college enrollment, as opposed to high school resources linking students to other multiple post high school pathways, i.e. apprenticeships, military, certification.
In addition to research on the high school environment, the role of gender and college enrollment has also been explored by scholars. Female postsecondary enrollment has been increasing since the 1970s (Perna, 2006). Studies show that female high school graduates are more likely to enroll at a postsecondary institution than male high school graduates (Coca et al., 2017; Perna, 2006). Researchers Coca et al. and Perna reported no gender-based data to indicate gender differences in how likely a student was to enroll in a postsecondary institution immediately after high school.

Race has also been a focus of college enrollment research. Researchers have found inequalities between Black and Latino students enrolling in college as opposed to their white counterparts (Coca et al., 2007; Engberg & Wolniak, 2010; Hill, 2008; Perna, 2006). Black and Latino students have been found to be less likely than White and Asian students to immediately enroll in a postsecondary institution after graduating from high school (Coca et al., 2017). Hill (2008) found that Black and Latino students were concentrated in schools that offered more basic strategies and supports for postsecondary enrollment, which could negatively impact students’ postsecondary enrollment decision. Continuing to check for inequities and differences in postsecondary enrollment based on race is important for practitioners to continue improving access to postsecondary options for all students.

**College Readiness**

As mentioned previously, college readiness is defined as the ability to find academic success in college without remedial programming. High school curriculum should assist students in developing an understanding of what type of postsecondary training they need for the career of their choice. A strong high school curriculum will
encourage students to explore all potential post-high school opportunities. College may not be the only pathway for a student to participate in a chosen career. For instance, one does not need a Bachelor’s degree to become a dental assistant. In fact, a certificate or an Associate’s degree will give a person the needed skill set to become a dental assistant (Washington Occupational Information Service [WOIS], 2017). Career choices and pathways require different types of training. Some careers may require a four-year Bachelor’s degree, or a one-year certification training while other careers require on-the-job training (i.e. apprenticeship or peer-to-peer programs). However, some students may learn too late, after investing time and money, that further coursework is needed to enter into their career of choice. The time and money spent on training for a career, is money and time during which that person is not actually working to earn an income (Mincer, 1958). Thus, educators should be prepared to help students with career research so they choose appropriate postsecondary training programs whether that is a two-year, technical, or four-year college or apprenticeship program.

The American Association of School Administrators (AASA) (2016) recognized that standardized test scores used to indicate a student’s college readiness alone did not depict the student’s overall ability to successfully earn a two or four-year degree. Schools and districts have looked for easily identifiable and accessible indicators, or data to identify students who are college ready or at risk of not being ready for college. AASA identified cognitive college-ready indicators such as a high school GPA between 2.8 and 4.0, enrollment in Advanced Placement (AP) courses, and completion of the ACT or SAT (college enrollment tests). College-ready indicators function as a part of an early warning system that alerts specific staff to students that may need some additional support before
leaving high school. By using AASA's (2016) college-ready indicators, educators are able to identify students that may need more assistance with college applications. Many schools and districts already collected the college ready data points recommended by AASA. Educators can access and use data collected to identify students that need more assistance with college readiness.

Using college-readiness inspired standards and indicators, in conjunction with curriculum in K-12 schools, enables students to explore careers of interest as well as learn what postsecondary training is needed to enter a career of their choice. High school students may begin the training necessary for their career of choice, resulting in earlier earning potential. Researchers suggested that the decision to go to college begins as early as seventh grade (Cabrera & La Nasa, 2000) prompting states, such as Washington, to pass legislation for High School and Beyond Plans (HSBP), requiring students to explore career choices beginning in seventh or eighth grade (OSPI, 2017). Section four of Washington State House Bill 2224 (2017) amending RCW 28A.230.090 outlined the elements of the HSBP:

“Identification of career and life goals through a career interest inventory. Identification of educational goals in a personalized pathway in support of career interest. A four-year course plan for high school aligned with postsecondary plans. Identification of assessments needed to earn a diploma and achieve postsecondary goals” (OSPI, 2017, para 3).

The main objective of the Washington HSBP is to support every high school student in the creation of a plan outlining potential goals and outcomes after high school. These goals may include entering the workforce, seeking training/certification for a career,
and/or beginning at a two- or four-year college/university.

To assist students with college readiness, Washington State has aligned high school graduation requirements with college entrance requirements by requiring high school graduates from the class of 2019 forward to earn 24 credits, an increase from 20 credits (OSPI, n.d.). The 24-credit requirement is aligned with Washington State’s College Academic Distribution Requirements (CADRs). CADRs are the courses students need to take in order to be eligible to apply to four-year colleges/universities in Washington State (WSAC, 2016). Because of the focus on academics, the State of Washington has encouraged students to take advanced/college preparatory courses, which researchers have found to be predictive human capital indicators of college enrollment (Engberg & Wolniak, 2010, 2014; Pike et al., 2014; Rowan-Kenyon, 2007).

With the Federal Government’s passage of NCLB in 2002 and the updated version of the law entitled ESSA in 2015, standardized tests in public education have become a large part of holding schools and educators accountable for getting students college-ready (Fraser, 2010; Jaeger, 2014; Smarick, 2010). Beginning with the class of 2019, in addition to credit and course requirements, Washington State students are required to pass the Smarter Balanced Assessment (SBA) in English Language Arts (ELA) and mathematics to graduate from high school (OSPI, n.d.). Presently, the state of Washington requires students to take the ELA SBA in 10th grade and the mathematics SBA in 11th grade. There is an implied expectation that most students will be in Algebra Two when they take the mathematics SBA. Students may use SBA scores at 256 colleges and universities for placement into college level courses without remediation (SBAC, n.d.).
High School Academic Success

The academic factors associated with college enrollment and success were a students’ Grade Point Average (GPA), advanced course work, and standardized tests. Researchers suggested that a student’s high school GPA predicted college enrollment (Coca et al., 2017; Engberg & Wolniak, 2010). Students with a higher final high school GPA were more likely to enroll in a four-year college, while those with lower final high school GPAs were less likely to enroll in postsecondary educational programs (Engberg & Wolniak, 2010). Related to GPA, performance metrics such as class rank were found to be positively related to students’ college graduation within six years (Pike et al., 2014).

Challenging high school curriculum had a positive association with students graduating from college within four or five years of postsecondary enrollment (Pike et al., 2014). The number of AP courses taken by students increased the likelihood of four-year college enrollment (Engberg & Wolniak, 2010). The data that were collected and analyzed in this study provided value in program planning as educators attempt to ensure that students of diverse backgrounds are accessing AP courses, advanced coursework. Completion of higher levels of math increased the likelihood of students’ enrollment in two- or four-year colleges (Engberg & Wolniak, 2010; Rowan-Kenyon, 2007). Through Rowan-Kenyon’s study, it was determined that 37% of students enrolled in college immediately after graduating had completed advanced math courses above Algebra Two.

Most four-year colleges require college entrance exams as a part of the admissions process. Many students take either the ACT or the SAT and those scores are used by the universities as an indicator of a student’s readiness for college. Pike et al. (2014) found that students’ degree attainment was positively related to their SAT score, a
higher score increased the odds of a student earning their Bachelor’s degree within four years. Rowan-Kenyon (2007) found that students that scored higher on achievement tests were more likely to enroll in college immediately after high school than students with lower scores. In Washington State, beginning with the class of 2019, students will be required to pass the SBA in ELA and mathematics in order to graduate from high school with a Washington State Career and College Readiness diploma (OSPI, n.d.).

**Summary of the Literature**

Throughout the literature review, results consistently showed that there are multiple factors involved in a students’ choice to enroll in postsecondary education. Research indicated that the timing of a student’s enrollment in postsecondary education was impacted by characteristics related to the school environment, where they attended school as well as familial factors, in addition to individual factors (Engberg & Wolniak, 2010, 2014; Rowan-Kenyon, 2007). Commonalities found in all those data points indicated that SES, race, current high school performance, peer groups, and parental influence were all worthy of further examination. The timing of the student’s choice to enroll in a postsecondary education program also impacted degree completion (Pike et al., 2014). It is important to identify the factors contributing to immediate postsecondary enrollment. Research on past postsecondary enrollment data aided researchers in determining patterns of postsecondary enrollment changes. Graduates who delayed enrollment or chose not to enroll in a postsecondary institution immediately following high school graduation had fewer financial resources and showed less preparation for their career later in life (Rowan-Kenyon, 2007). Additionally, individual factors that a student is unable to mitigate, such as race and SES (Coca et al., 2007; Engberg &
Wolniak, 2010; Hill, 2008; Perna, 2006), have to be sensitively studied in the world of postsecondary planning.

The decision to attend college begins as early as seventh grade and can be influenced by school environment, parents, and the student’s personality (Cabrera & La Nasa, 2000). Exposure to comprehensive post-high school planning curriculum increases a student’s opportunity to enroll in postsecondary training immediately after high school. Curriculum should focus on the enrollment process and the benefit of postsecondary training, which should begin at ninth grade or earlier. While research indicated both parents and peer groups as strong influences in postsecondary education choices for a student (Palardy, 2013), all four years of high school were needed to develop relationships to encourage a student to enroll in postsecondary education. Engberg and Wolniak’s (2010, 2014) and Rowan-Kenyon's (2007) research to determine reasons students delay enrollment into college is significant work in the continuing effort to identify predictors for why students enroll immediately following high school graduation.

As part of this research study, several factors were evident regarding the timeliness, scope and depth of the research available on students’ choice to enroll in postsecondary education. Each of the aforementioned studies used data that were greater than a decade old, which may not reflect the current climate of high schools, nor reflect the profile of today’s high school students. High school graduates of 1992 and 2004 are different from the high school graduates of 2017 for their use of technology, recent educational laws and policies, and changes in training required to enter the job market. For students living in low-income households, the decision to enroll in a postsecondary institution is a financial decision as students’ and their families rely on financial aid
packages to assist with the cost of postsecondary education (Cabrera & La Nasa, 2000).

This review of literature yielded a series of factors in students’ educational and personal environment that can be impacted positively to increase the likelihood that a student will engage in postsecondary education immediately after high school graduation. Individual factors such as advanced coursework, GPA and standardized test scores are all elements that yield individual data points, which can be encouraged and fostered by educators, peers and parents (Coca et al., 2007; Engberg & Wolniak, 2010, 2014; Hill, 2008; Pike et al., 2014; Rowan-Kenyon, 2007). School improvement plans should include components to make sure low-income and non-white students complete advanced coursework whenever possible in order to facilitate postsecondary enrollment. As the profile of the current high school graduates is rapidly changing, continued professional development for educators to understand the factors predictive of immediate college enrollment must be delivered to all educators with regularity and timeliness.
Chapter Three: Research Design and Methodology

Introduction

This study used direct logistic regression to examine the predictors of a student’s decision to enroll in a postsecondary institution (either at a two-year college, technical college, four-year college, or non-enrollment) immediately following high school graduation. The human capital academic success indicators and demographic data associated with postsecondary enrollment immediately following high school graduation were examined for this study. The sections included within this chapter describe the research design, analysis, research question and hypothesis, population, and variables.

Quantitative methods were used in this study to address the research question and hypothesis. This study sought to provide a clearer understanding of each human capital academic success indicator and how each one impacts a student’s decisions regarding immediate enrollment in a postsecondary institution after high school graduation. The data used in this study included postsecondary enrollment status, race, gender, FRPL, CBS enrollment, high school attended (HS1 or HS2), high school grade point average (GPA), number of AP courses taken in high school, number of math credits earned beyond Algebra Two, Smarter Balanced Assessment (SBA) English Language Arts (ELA) scale scores and whether a student filed the Free Application for Federal Student Aid (FAFSA) as either self-reported by students in May on their senior exit survey or reported by the career & college readiness counselor in June.

Research Design

This study followed a correlational research design to explore the relationship between human capital academic success indicators and immediate postsecondary
enrollment. A direct logistic regression was used to analyze ex post facto data from the school district’s student information system and its subscription to the National Student Clearinghouse (NSC). NSC reports enrollment and degree information from 3,600 colleges and universities. School districts are able to subscribe to the service for information regarding their graduates (NSC, n.d.).

The primary aim of this study was to examine the predictive relationship between human capital academic success indicators and student enrollment or non-enrollment in a postsecondary institution or program. As confirmed in the literature review (Belasco, 2013; Coca et al., 2017; Engberg & Wolniak, 2010, 2014; Hill 2008; Perna, 2006), the demographics of the students were also vital variables to examine as they provide information that can be disaggregated for educational planning purposes as well as the training of educators. The researcher chose to explore the demographic factors as they may explain patterns within the sample. This study included the following demographic data: high school attended, race, gender, CBS enrollment, and socioeconomic status measured by FRPL enrollment.

Analysis

Logistic Regression

A direct logistic regression was chosen as the appropriate statistical analysis because the researcher measured a dichotomous variable (e.g. a student either enrolled or not enrolled in a postsecondary institution) and there were no specific hypotheses that have identified which predictor variable will have the most impact on the criterion variable (Tabachnick & Fidell, 2013). Using a logistic regression allowed the researcher to determine the likelihood that the academic success indicators (high school GPA,
number of AP courses taken in high school, number of math credits earned above Algebra Two, and SBA ELA) and demographic data (high school attended, race, gender, CBS enrollment, and FRPL enrollment) predicted postsecondary enrollment.

For the purposes of this study, students were categorized as either enrolled or not enrolled in a postsecondary institution. The first group consisted of students that enrolled in a postsecondary institution or program the academic year immediately following high school graduation (fall quarter enrollment). For the purpose of this study, the type of institutions the researcher considered as postsecondary enrollment included two-year, technical, and four-year institutions. The second group for this study were students that did not enroll in a postsecondary institution or program the fall quarter following high school graduation. Utilizing the December NSC report from the school district’s 2017 graduates, students not enrolled in a postsecondary institution or program were identified.

**Assumptions of Logistic Regression**

A logistic regression was chosen as there does not need to be distribution assumptions of the predictor variables (Tabachnick & Fidell, 2013). Tabachnick and Fidell (2013) suggested that “predictors do not have to be normally distributed, linearly related to the dependent variable, or of equal variance within each group…predictors can be any mix of continuous, discrete, and dichotomous variables” (p. 439). In other words, a logistic regression has the flexibility to enable the researcher to find the predictor variables that had the most impact on immediate postsecondary enrollment.

**Research Question**

**Question**

The review of literature yielded different success indicators related to a student’s
decision to enroll in a postsecondary institution immediately following high school
graduation. Many of those success indicators were measured as individual values. This
prompted the researcher to explore which human capital academic success indicators best
predict student postsecondary enrollment immediately following high school graduation
in one school district located in the northwest region of Washington State.

**Null Hypothesis**

As noted in the review of literature, school characteristics were determined to
have an impact on students’ decisions to enroll in postsecondary education immediately
following high school graduation. This study addressed the human capital academic
success indicators in the following null hypothesis. The likelihood that a high school
graduate will enroll in a postsecondary institution immediately following high school
graduation is not related to the high school a student attended, students’ race, gender,
CBS enrollment, FRPL enrollment, high school GPA, number of AP courses taken in
high school, number of math credits earned above Algebra Two, SBA ELA scale score,
and students’ FAFSA completion status.

**Population**

The school district, located approximately 24 miles north of downtown Seattle,
serves 15,470 students in twelve elementary schools, four middle schools, two
comprehensive high schools, and one alternative high school. As shown is Table 1, the
demographic data for high school one (HS1) for the 2016-2017 school year were reported
as: total population 2,065; 17% of students qualify for free or reduced priced lunch;
student ethnicity for HS1 was reported as 22% Asian, 9% Black, 11% Hispanic/Latino of
any race(s), 9% Multi-Racial, 55% White; with 48% female students and 52% male
students. Demographic data for high school two (HS2) for the 2016-2017 school year were reported as: total population 2,196; 59% of students qualify for free or reduced priced lunch; student ethnicity for HS2 was reported as 14% Asian, 3% Black, 38% Hispanic/Latino of any race(s), 7% Multi-Racial, 31% White; with 47% female students and 53% male students.

The school district demographic information for the 2016-2017 school year consisted of: 48% of students qualified for free or reduced priced lunch; student ethnicity for the district was reported as 15% Asian, 7% Black, 29% Hispanic/Latino of any race(s), 10% Multi-Racial, 39% White; with 48% female students and 52% male students. Demographic data may reveal patterns of postsecondary enrollment that are important to examine and use when brainstorming solutions to any discovered gaps in postsecondary enrollment.

Table 1

<table>
<thead>
<tr>
<th>2016-2017 District and School Demographic Data</th>
<th>School District</th>
<th>HS1</th>
<th>HS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment</td>
<td>15,470</td>
<td>2,065</td>
<td>2,196</td>
</tr>
<tr>
<td>Free or Reduced-Price Meals</td>
<td>48%</td>
<td>17%</td>
<td>59%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48%</td>
<td>48%</td>
<td>47%</td>
</tr>
<tr>
<td>Male</td>
<td>52%</td>
<td>52%</td>
<td>53%</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>15%</td>
<td>22%</td>
<td>14%</td>
</tr>
<tr>
<td>Black / African American</td>
<td>7%</td>
<td>9%</td>
<td>3%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>29%</td>
<td>11%</td>
<td>38%</td>
</tr>
<tr>
<td>Multi-Racial</td>
<td>10%</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>White</td>
<td>39%</td>
<td>55%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Sample

Class of 2017 graduate data, from the two comprehensive high schools, were
examined for this study (see Table 2). Of the high school graduates from HS1 (N = 445), 10% of high school graduates qualified for free or reduced priced lunch; 12% students were enrolled in the CBS program; student ethnicity for HS1 included 22% Asian, 2% Black, 8% Hispanic/Latino of any race(s), 10% Multi-Racial, 57% White; with 53% female students and 47% male students. Of the high school graduates from HS2 (N = 422) 46% of students qualified for free or reduced priced lunch; 45% students enrolled in the CBS program; student ethnicity for HS2 included 17% Asian, 10% Black, 34% Hispanic/Latino of any race(s), 6% Multi-Racial, 31% White; with 52% female students and 48% male students.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>HS1</th>
<th>HS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of High School Graduates</td>
<td>445</td>
<td>422</td>
</tr>
<tr>
<td>Free or Reduced-Price Meals</td>
<td>10%</td>
<td>46%</td>
</tr>
<tr>
<td>College Bound Scholarship Program</td>
<td>12%</td>
<td>45%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>53%</td>
<td>52%</td>
</tr>
<tr>
<td>Male</td>
<td>47%</td>
<td>48%</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>22%</td>
<td>17%</td>
</tr>
<tr>
<td>Black / African American</td>
<td>2%</td>
<td>10%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>8%</td>
<td>34%</td>
</tr>
<tr>
<td>Multi-Racial</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>White</td>
<td>55%</td>
<td>31%</td>
</tr>
</tbody>
</table>

Variables

Dependent Variable

The dichotomous dependent variable was postsecondary institution enrollment, enrolled (yes) or not enrolled (no). For the purposes of this study, enrollment (yes) was
the fall quarter immediately following high school graduation and was determined by enrollment at two-year, technical, or four-year institutions.

**Postsecondary enrollment status.** Students’ postsecondary institution enrollment status was retrieved from National Student Clearing House December monthly report.

**Independent Variables**

Data analysis for this study was conducted using demographic data, and human capital academic success indicators as the independent variables to verify if certain factors had predictive elements on students’ immediate postsecondary enrollment decisions.

**Demographic data.** High school attended, race, gender, CBS enrollment, and FRPL enrollment data were retrieved from the district-wide student information system.

**Human capital academic success indicators.** The following human capital academic success indicators were chosen based on the literature reviewed in chapter two. High school GPA, number of AP courses taken in high school, number of math credits earned above Algebra Two, and SBA ELA scores were retrieved from the district-wide student information system. Students’ FAFSA completion status from HS1 was retrieved from the self-reported senior exit survey completed in May and June of 2017 at each comprehensive high school. Students’ FAFSA completion status from HS2 was provided by the Career & College Readiness Counselor that kept the record of June 2017 FAFSA completion from the WSAC information portal.

**Summary of the Research Design and Methodology**

This study sought to determine the predictive variables for postsecondary institution enrollment immediately following high school graduation. A correlational
research design using ex post facto data was used. The results of this study are reported in Chapter Four. Interpretations of the data analysis results are explained in Chapter Five.
Chapter Four: Results

This research explored student academic success indicators and demographic variables to determine those that were most significant in predicting whether students enrolled in a postsecondary institution immediately following high school graduation. The sample of students came from a mid-sized school district in Washington State and consisted of the graduating class of 2017 from the two comprehensive high schools in one school district.

A binary direct logistic regression analysis was performed using IBM SPSS. The dependent variable, postsecondary enrollment status, was binary, and coded as 1 and 0. Responses that indicated yes were coded as 1 and indicated that the student enrolled in a two-year, technical, or four-year college. Responses that indicated no was assigned a numerical value of 0 and represented students that were not enrolled at a postsecondary institution during the fall quarter following their high school graduation. To determine the existence of a correlation to students’ decision to enroll at a postsecondary institution, the four human capital academic success indicators (high school grade point average [GPA], Smarter Balanced Assessment [SBA] English Language Arts [ELA], total AP course credit, and total math credits earned above Algebra Two); and demographic variables (gender, high school attended, race, FRPL, CBS enrollment, and Free Application of Federal Student Aid [FAFSA]) were examined.

Analysis of Assumptions

Ratio of Cases to Variables and Missing Data

Using an Estimated Means (EM) algorithm through SPSS Missing Value Analysis (MVA), 16 cases with missing values on a continuous predictor, SBA ELA, were found.
To test if the sample size was large enough for the researcher to drop the cases with missing data, the researcher tested the estimation of $R$ to evaluate the size of the effect of adding predictors. The estimation of $R$ is dependent on the number of predictors, $k$, and the sample size, $N$ (Field, 2013). Field (2013) suggested, the equation for expected $R$ is: $k/(N-1)$. In the case of this research $R=10/(867-1) = .01$, which is very close to zero, indicating that the sample size is large enough to exclude the 16 cases with missing data. After the exclusion of the 16 cases with missing values, data from 867 graduates were utilized for analysis: 533 graduates enrolled in a postsecondary institution and 334 did not enroll in a postsecondary institution.

**Linearity of the Logit**

This study contained four continuous variables (Cumulative GPA, SBA ELA, Total AP credits, and math credits above Algebra Two), and each one was checked for a linear relationship to the log of the outcome variable, postsecondary enrollment (Field, 2013). An underlying assumption of logistic regression is that “there is a linear relationship between any continuous predictors and the logit of the outcome variable… and the assumption is typically be tested by examining whether the interaction between the predictor and its log transformation is significant” (Field, 2013, p.769). The linearity of the logit was tested to ensure the data were linear. The results of the Box-Tidwell check for the linearity of the logit are presented in Table 3. According to Field (2013) “any interaction that is significant indicates that the main effect has violated the assumption of linearity of the logit” (p. 794). Cumulative GPA, Total AP credits, SBA ELA, and math credits above Algebra Two interactions were $p > .05$; that meant the assumption of the linearity of the logit was supported.
Table 3

*Check for Linearity of the Logit*

<table>
<thead>
<tr>
<th>Step 1</th>
<th>$B$</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>p</th>
<th>Exp($B$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cum GPA by Ln(GPA)</td>
<td>-2.62</td>
<td>2.99</td>
<td>.77</td>
<td>1</td>
<td>.38</td>
<td>.07</td>
</tr>
<tr>
<td>Ln(SBAELA) by SBA ELA Score</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>1</td>
<td>.98</td>
<td>1.00</td>
</tr>
<tr>
<td>Ln(AP) by Total AP Credits</td>
<td>-.17</td>
<td>.16</td>
<td>1.06</td>
<td>1</td>
<td>.30</td>
<td>.85</td>
</tr>
<tr>
<td>Ln(AboveAlg) by Math Credit Above Alg Two</td>
<td>-.99</td>
<td>.87</td>
<td>1.30</td>
<td>1</td>
<td>.26</td>
<td>.37</td>
</tr>
<tr>
<td>Constant</td>
<td>-12.91</td>
<td>11.70</td>
<td>1.22</td>
<td>1</td>
<td>.27</td>
<td>.00</td>
</tr>
</tbody>
</table>

**Multicollinearity**

Field (2013) recommends using the variance inflation factor (VIF) and the tolerance statistic to check the multicollinearity of the predictors. All of the independent variables produced low risk tolerance levels ranging from .41 to .93 (Table 4). These values were well above the recommended .2 potential problem threshold (Field, 2013). All of the independent variables had low risk of violating the VIF. The greater the value above .2, the stronger the multicollinearity of the variables (Field, 2013).
Analysis of the Research Question

The researcher tested which variables were likely to predict postsecondary enrollment immediately following high school graduation. Data in this research were gathered from graduates of both comprehensive high schools from one school district. Data in the study were representative of students from the graduating class of 2017 (n=867) and were used to conclude which variables are the most influential in predicting students’ immediate postsecondary enrollment. This section details the statistical models constructed to identify the strength of variables in predicting immediate postsecondary enrollment after high school. First, the constant-only model was provided to indicate the strength of the model without any predictors. Then, the significance of the model, the regression coefficients, and goodness-of-fit measures (i.e., chi-squared, -2 log likelihood [-2LL], and Nagelkerke R square) were provided to identify the amount of variation in students’ decisions to enroll in a postsecondary institution immediately following high

Table 4

Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Gender</th>
<th>High School Attended</th>
<th>Race</th>
<th>FRPL</th>
<th>CBS</th>
<th>Cum GPA</th>
<th>SBA ELA Score</th>
<th>Total AP Credits</th>
<th>Math Credit Above Algebra Two</th>
<th>FAFSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collinearity Statistics</td>
<td>Tolerance</td>
<td>VIF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.93</td>
<td>1.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High School Attended</td>
<td>.72</td>
<td>1.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Race</td>
<td>.93</td>
<td>1.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FRPL</td>
<td>.72</td>
<td>1.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBS</td>
<td>.74</td>
<td>1.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cum GPA</td>
<td>.58</td>
<td>1.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SBA ELA Score</td>
<td>.87</td>
<td>1.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total AP Credits</td>
<td>.41</td>
<td>2.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Math Credit Above Algebra Two</td>
<td>.44</td>
<td>2.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FAFSA</td>
<td>.83</td>
<td>1.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
school graduation accounted for by the predictor variables.

**Evaluation of the Model without Predictors**

The constant only model, with no predictors, was tested through logistic regression to predict students’ immediate postsecondary enrollment (outcome variable) before the predictor variables were added. Results suggested that without any predictors, the constant only model was able to correctly predict 61.5% of the time whether a student decided to immediately enroll in a postsecondary institution or delay enrollment. Thus, based on chance, 61.5% of the time one would accurately predict the postsecondary enrollment of a student.

**Significance Tests for Each Predictor**

It was important to check for significance of the variables not in the constant-only model, as significance of $p \leq .05$ indicates that the predictor variable had some impact on the model. As seen in Table 5, each independent variable not in the constant-only model added to the predictive power of students’ decision to enroll in a postsecondary institution ($p < .05$), with the exception of three racial categories and gender ($p > .05$). The racial categories of Black, Multi-Racial, and Pacific Islander, may have had too few students to be statistically significant (Black $N = 52$, Multi-Racial $N = 69$, and Pacific Islander $N = 9$). However, the category “Race”, which consisted of all 6 race subcategories, was statistically significant ($p < .01$), meaning race may have still added to the predictive power of students’ decision to enroll in a postsecondary institution.
Table 5

*Variables not in the Equation*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Score</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender(1)</td>
<td>2.95</td>
<td>1</td>
<td>.09</td>
</tr>
<tr>
<td>High School Attended(1)</td>
<td>43.86</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>Race</td>
<td>37.30</td>
<td>6</td>
<td>.00</td>
</tr>
<tr>
<td>Asian</td>
<td>4.34</td>
<td>1</td>
<td>.04</td>
</tr>
<tr>
<td>Black</td>
<td>.33</td>
<td>1</td>
<td>.56</td>
</tr>
<tr>
<td>Multi-Racial</td>
<td>.01</td>
<td>1</td>
<td>.91</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>32.27</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>.14</td>
<td>1</td>
<td>.71</td>
</tr>
<tr>
<td>White</td>
<td>12.03</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>FRPL(1)</td>
<td>15.67</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>CBS(1)</td>
<td>4.72</td>
<td>1</td>
<td>.03</td>
</tr>
<tr>
<td>Cum GPA</td>
<td>171.28</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>SBA ELA Score</td>
<td>29.39</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>Total AP Credits</td>
<td>76.04</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>Math Credits Above Algebra Two</td>
<td>77.40</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>FAFSA(1)</td>
<td>128.05</td>
<td>1</td>
<td>.00</td>
</tr>
<tr>
<td>Overall Statistics</td>
<td>242.04</td>
<td>15</td>
<td>.00</td>
</tr>
</tbody>
</table>

**Evaluation of the Fit**

Once the predictor variables were added to the constant-only model, the new model, Model 1, was evaluated for fit. The chi-square statistic in the *Omnibus Tests of Model Coefficients* (see Table 6) was the difference between the current model and the constant-only model (1155.832-889.470 = 266.36) (Field, 2013). The Model 1 summary had an 889.47 -2 Log likelihood (-2LL), (a significantly reduced -2LL compared to the constant-only model, or baseline model, the initial -2 LL = 1155.83). This suggested that the current model explained more of the variance in the outcome; thus, the prediction accuracy of the model improved when the independent variables were added to the constant-only model.
Table 6

Omnibus Tests of Model Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Chi-square</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>266.36</td>
<td>15</td>
<td>.00</td>
</tr>
<tr>
<td>Block</td>
<td>266.36</td>
<td>15</td>
<td>.00</td>
</tr>
<tr>
<td>Model</td>
<td>266.36</td>
<td>15</td>
<td>.00</td>
</tr>
</tbody>
</table>

A chi-square of 266.36 with 15 degrees of freedom (df), indicated that this model was statistically significant ($p < .01$), which indicated that Model 1 was a better fit than the constant only model (see Table 7). The $R^2$ values indicated approximately how much variation in students’ decisions to enroll in a postsecondary institution was explained by the model. Nagelkerke’s $R^2$, was .36 which suggested that the proportion of explained variation in postsecondary enrollment was 36%.

Table 7

Model Summary

<table>
<thead>
<tr>
<th>Step</th>
<th>-2 Log likelihood</th>
<th>Cox &amp; Snell R Square</th>
<th>Nagelkerke R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>889.47</td>
<td>.265</td>
<td>.36</td>
</tr>
</tbody>
</table>

Odds Ratio

According to Field (2013), the Wald statistic indicates whether “the $b$ coefficient for that predictor is significantly different from zero. If the coefficient was significantly different from zero, one can assume that the predictor is making a significant contribution to the prediction outcome (Y)” (p. 784). For these data, the Wald statistic suggested that high school attended ($p < .01$), cumulative GPA ($p < .01$), math credits above Algebra Two ($p < .05$), and completion of FAFSA ($p < .01$) were significant predictors of postsecondary enrollment immediately following high school graduation.

The odds ratio, or exponential of $B$, is shown in Table 8 “is an indicator of the
change in odds from a unit change in the predictor” (Field, 2013, p. 766). The following statistically significant predictors had odds ratios greater than one: high school attended, cumulative GPA, and math credits above Algebra Two. \( \text{Exp}(B) \) for each variable indicated that as the predictor increased in value, the odds of postsecondary enrollment increased. With both lower and upper 95% confidence intervals above one, the odds of enrollment also increased. The completion of FAFSA had an odds ratio less than one, which indicated that completion of FAFSA was associated with reduced odds of postsecondary enrollment immediately following high school graduation.

Table 8

*Variables in the Equation*

<table>
<thead>
<tr>
<th>Variables in the Equation</th>
<th>Wald</th>
<th>( p )</th>
<th>( \text{Exp}(B) )</th>
<th>95% C.I. for ( \text{Exp}(B) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender(1)</td>
<td>.56</td>
<td>.46</td>
<td>1.14</td>
<td>.81  1.60</td>
</tr>
<tr>
<td>High School Attended(1)</td>
<td>9.16</td>
<td>.00</td>
<td>1.80</td>
<td>1.23 2.64</td>
</tr>
<tr>
<td>Race</td>
<td>7.71</td>
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Classification Table

Model 1 correctly classified 216 graduates that did not immediately enroll in a postsecondary institution following high school graduation but misclassified 118 (it correctly classified 64.7% of cases). The model also correctly classified 448 graduates that immediately enrolled in a postsecondary institution following high school graduation but misclassified 85 (the model correctly classified 84.1% of cases). The overall accuracy of the classification was 76.6% (see Table 9), which was the weighted value of the percentage correct (Field, 2013). The constant-only model correctly classified 61.5% of graduates, however with the inclusion of the independent variables, the correct classification increased to 76.6% accuracy; an improvement of 15%.

Table 9

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Summary of the Results

The purpose of this chapter was to report the results of a model that potentially predicted postsecondary enrollment immediately following high school graduation. The constant-only model correctly classified 61.5% of graduates. With the inclusion of the independent variables classification accuracy improved by 15% to 76.6%. Findings from the logistic regression identified significant predictors of students’ decisions to enroll at a postsecondary institution. When the following predictive variables high school attended,
cumulative GPA and math credits above Algebra Two were added to the constant-only model, the odds of postsecondary enrollment increased. Completion of FAFSA predicted a decrease in the odds of postsecondary enrollment for students. Chapter Five addresses the interpretation and discussion of the results, a discussion of the limitations, implications for future studies, and conclusions of this study.
CHAPTER Five: Discussion

This study examined the predictor variables that contribute to students’ decisions to enroll at a postsecondary institution immediately following graduation from high school. The following research question was addressed in this study: Which human capital academic success indicators best predict student postsecondary enrollment immediately following high school graduation in one school district located in the northwest region of Washington State? A binary logistic regression was used to answer the research question. In this chapter, the researcher discusses the results presented in Chapter Four, along with a discussion of the limitations, implications and recommendations for future studies, and conclusions of this study.

Findings

Among the 10 predictor variables, the Wald statistic suggested that high school attended \((p < .01)\), cumulative GPA \((p < .01)\), math credits above Algebra Two \((p < .05)\), and FAFSA completion \((p < .01)\) were significant predictors of postsecondary enrollment immediately following high school graduation. Three predictor variables contributed to the odds of increasing postsecondary enrollment: high school attended, cumulative GPA, and math credits above Algebra Two; and one predictor variable contributed to decreasing the odds of postsecondary enrollment: FAFSA completion.

High School Attended

The characteristics of the high school had an impact on students’ decisions to enroll at a postsecondary institution immediately following high school graduation. The predictor variable, high school attended, had an odds ratio greater than one. This indicated that the odds of postsecondary enrollment increased for students who attended
HS2. The odds of students that attended HS2 enrolling at a postsecondary institution were almost two times more likely than those that attended HS1.

Researchers have found that postsecondary enrollment varies by the type of high school the student attends with schools whose population is made up of high socioeconomic status (SES) producing higher enrollment at postsecondary institutions (Coca et al., 2017; Engberg & Wolniak 2014; Hill, 2008; Palardy, 2013; Perna, 2006). The two high schools studied significantly differed in free and reduced price lunch program (FRPL) enrollment and a few demographic indicators including race, English Language Learners (ELL) and special education enrollment. The research finding in the current study contradicted prior studies. During the 2016-2017 school year, HS2 had approximately 59.2% of students enrolled in FRPL, whereas HS1 had approximately 17.2% of students enrolled in the FRPL program. HS2 was eligible to receive Title 1 funds from the US Department of Education, used to ensure that all students meet state academic standards, especially those from low-income households (US Department of Education, 2015). With HS2 being identified as a low-income school (with more than 40% of students enrolled in the FRPL program, which qualified HS2 for Title 1 funds), these findings did not support the research (Coca et al., 2017; Engberg & Wolniak 2014; Hill, 2008; Palardy, 2013; Perna, 2006). HS1 qualified for fewer state and federal resources to assist struggling students due to their low FRPL percentage. The researcher speculated that HS2 had more resources available to help low-SES students obtain knowledge and access to postsecondary education, which has helped break the cycle of poverty.

High School GPA
The predictor variable, high school GPA, had an odds ratio greater than one. This indicated that the odds of postsecondary enrollment improved as students’ GPAs increased. The odds of students with a higher GPA enrolling at a postsecondary institution were almost three times more likely than those with a lower GPA. This finding is consistent with the body of literature (Belesco, 2013; Engberg & Wolniak, 2010; Rowan-Kenyan, 2007) that suggests that students with high academic ability and achievement are more likely to enroll at postsecondary institutions.

**Total Math Credits Above Algebra Two**

The predictor variable, total math credits above Algebra Two, had an odds ratio greater than one. This indicated that the odds of postsecondary enrollment improved as students’ earned math credit at a level above Algebra Two. Algebra Two is the minimum level of math that students must pass in order to be eligible to apply for enrollment at a four-year college in Washington State (WSAC, 2016). Students earning math credits above Algebra Two have a small advantage as the odds of a student enrolling in a postsecondary institution increase 1.3 times as the student earns higher level math credits. This finding is consistent with the body of literature from Engberg and Wolniak (2010) and Rowan-Kenyon (2007) who found that students completing higher levels of math were more likely to enroll in a postsecondary institution immediately following high school graduation.

**FAFSA Completion**

The predictor variable, FAFSA completion, had an odds ratio less than one. This indicated that the odds of postsecondary enrollment decreased as students completed the FAFSA. This study suggested that students that completed the FAFSA were less likely to
enroll at a postsecondary institution immediately following high school graduation. These findings were unexpected and inconsistent with the body of literature as the availability of financial aid (loans, scholarships, grants, work study, etc.) has been positively linked with college enrollment (Perna, 2006). The researcher is unsure of the reason the FAFSA completion results indicated that students were less likely to enroll in a postsecondary institution immediately following high school graduation. This warrants further study for an understanding of the relationship between these results and school or student characteristics.

Upon examining FAFSA and enrollment data from this study further, the researcher found that 123 students completed the FAFSA, yet did not enroll at a postsecondary institution; 131 students enrolled at a postsecondary institution yet did not complete the FAFSA. Filling out the FAFSA form engages a lengthy and complicated process that can be confusing to students and their parents, especially for first generation college students, non-native English speakers and low-SES students (Deming & Dynarski, 2009). Assistance and support from high school staff through the entire FAFSA completion process, which includes interpreting financial aid award letters from postsecondary institutions, will aid students and their parents with the completion of the financial aid process. Owen and Westlund (2016) found that increased school counselor outreach about FAFSA completion resulted in increased FAFSA completion and college enrollment.

**Implications for Professional Practice**

This study lends support for continued educator emphasis on GPA and challenging math coursework for students interested in enrolling at a postsecondary
institution immediately following high school graduation. Unexpected information resulted from this study. For example, students completing the FAFSA are less likely to enroll at a postsecondary institution. In the state of Washington, a large number of resources are utilized to assist students and their families with FAFSA completion. Local colleges and high schools hold College Goal Washington events, which partner financial aid officers from postsecondary institutions with families, to assist with FAFSA completion at several different locations throughout the state of Washington. WSAC and OSPI make FAFSA completion data available to school districts, educators, and the public via online resources and access to restricted portals. The findings from this research study should not discourage educators from continuing to assist students with FAFSA completion. There are many students that qualify for state and Federal grants based on FAFSA data and educators continuing to assist those students with better understanding of their need for a completed form may positively impact this data. Further research regarding FAFSA completion data would assist educators in targeted intervention, which may increase postsecondary enrollment for high school students. Without these funds from need-based grants, there are students who may not enroll or who may delay enrollment at a postsecondary school. Educators should continue to assist students and their families with financial aid and college cost information so that students and their families are able to understand and decide whether or not postsecondary education is cost effective for them.

This study also revealed that the high school students attended, or rather the characteristics of the high school the student graduated from, were a factor in postsecondary enrollment immediately following high school graduation. Interestingly,
graduates from HS2, which has a population with a large number of low-income students, are more likely to enroll at a postsecondary institution than students from HS1, which has a population with a small number of low-income students; this does not align with previous research (Coca et al., 2017; Engberg & Wolniak, 2014; Hill, 2008; Palardy, 2013; Perna, 2006). Practitioners should be aware of postsecondary enrollment resources that can contribute to students’ decision to enroll at a postsecondary institution.

Practitioners should also practice caution in assuming that students of higher SES do not need assistance with financial aid and college enrollment processes. The review of literature yielded information to support the idea that school characteristics also have an impact on the timing of postsecondary enrollment (Belasco, 2013; Engberg & Wolniak, 2014; Hill, 2008). The results section of this study offers educators insights for identifying characteristics of students at risk of non-enrollment in a postsecondary institution.

**Limitations**

**Low-income Identifiers**

Low-income identifiers used in this study may be incomplete due to the voluntary nature of the application process as well as the inability to verify information given by parents (Engberg & Wolniak, 2010; Musu-Gillette, 2016). Students and their parents must annually apply for the FRPL program, usually at the beginning of the school year. To be eligible for free lunch, students’ families must be at or below 130% of the Federal poverty income threshold, and at or below 185% of the Federal poverty threshold to be eligible for reduced lunch fees (National Center for Education Statistics [NCES], 2015). It has been disclosed to the researcher, while working as a school counselor, that one of
the reasons a high school student would not apply for the FRPL was that the student may choose not to eat lunch at school. Some students do not realize that there are additional college readiness benefits to enrolling in the FRPL program (e.g. free ACT and SAT exams, and reduced fees on AP exams).

In order for a student to be eligible for the CBS, students must enroll in the CBS program in the seventh or eighth grade, and continue to be eligible (from a low-income household, graduate from a Washington State high school with a 2.0 GPA or above, not convicted of a federal crime, enroll in an eligible Washington State postsecondary school, and file the FAFSA or the WASFA) within a year of graduation to receive funds (WSAC, n.d.). Upon the examination of CBS students and FAFSA completion in this study, 89 CBS students did not complete the FAFSA rendering them at risk of not receiving the CBS funds (students have until June following high school graduation to enroll at a Washington State postsecondary school and file the FAFSA or WASFA).

Upon examining FRPL and CBS data, the researcher found that 101 CBS-enrolled students were not receiving FRPL; and 95 students were receiving FRPL but not CBS. These numbers indicated that many students eligible for programs may not actually be enrolling in those programs or receiving the benefits that come with program enrollment. Though FRPL program data is not the preferred low-income identifier in research, FRPL information is an indicator used by WSAC to identify CBS participants. Therefore, FRPL information is the data that educators and education researchers have access to from school districts and is one way to identify low-income students and their families to offer resources. Students enrolled in the CBS program generally meet Federal and Washington State need-based grant opportunities upon FAFSA completion and thus, CBS students are
another way to identify low-income students and their families.

FAFSA completion data were either self-reported by students in May and June 2017 on their senior exit survey (HS1) or reported FAFSA completion from the WSAC information portal in June 2017 (HS2). Some students from HS1 may have incorrectly reported their FAFSA status. Additionally, data from the WASFA, Washington State financial aid for undocumented students, were not reported and may account for a number of students applying for state need-based aid, which were not reported to the WSAC information portal.

**National Student Clearinghouse (NSC)**

The NSC is a limitation as not all student enrollment is reported to NSC; some students may have been reported to the district as not enrolled when in fact they were enrolled. Dynarski, Hemelt, and Hyman (2015) report that in fall 2011, about 7% of institutions did not report their enrollment to the NSC. HS1 and HS2 have many international and undocumented students, who were not reported to NSC (NSC: Research Center, 2014). Students may use the Family Educational Rights and Privacy Act (FERPA) to prevent sharing information with NSC, which is more common for students who chose to attend two-year institutions (Dynarski et al., 2015). All of these factors could lead to misclassification of students as not enrolled at a postsecondary institution. However, many postsecondary institutions do report their enrollment to the NSC, therefore use of NSC data are a good resource for educators and researchers investigating postsecondary enrollment.

**Number of High Schools in the Study**

The study consisted of two comprehensive high schools within one school district
in Washington State. The results from this study may not apply to other schools within or outside of Washington State. A replication of this study including more schools would lend further insight and potential for widespread analysis.

**Non-Enrollment**

Gap year programs and military enlistment are two forms of non-traditional postsecondary pathway options for students to enroll/enlist in immediately after graduating from high school. Students enrolled in gap year programs and enlisting in the military immediately following high school graduation are not considered in this study as the enrollment information is not reported to the NSC. While students that opt to participate in gap year programs or military enlistment are not enrolling in traditional postsecondary learning institutions, students are enrolling in a program that will enhance their life knowledge and provide them with some form of training. Students may, after their experiences, decide to enroll in a postsecondary institution at a later date. The question that was examined by the researcher for this study was centered on immediate enrollment in a postsecondary institution (i.e. two-year, technical, or four-year college) which did not include a student’s decision to enroll in a non-traditional program. Future research could include these types of programs and their effects on students’ future careers and earning potential.

**Recommendations for Future Research**

**FAFSA**

With the continued focus on FAFSA completion by OSPI, educators are encouraged to take an active role in assisting students and their parents with FAFSA completion and the follow up required for students to gain postsecondary institutional
access. In order for a student to complete the FAFSA, parent information is needed. Engberg and Wolniak’s (2010) findings suggest that as a parent worries about affording college, the likelihood of students enrolling in a four-year college decrease. Educators need training and time to follow up with students, and their parents, who did not complete the FAFSA and still enrolled at a postsecondary institution; as well as time to follow up with those individuals that completed the FAFSA but did not enroll at a postsecondary institution immediately following high school graduation. Follow up is needed with these students to determine if there are any barriers that students may have faced while attempting to enroll in a postsecondary institution. A phenomenological qualitative study may address these points and help researchers and practitioners further understand students’ enrollment and FAFSA completion, or non-completion, choices.

**High School Attended**

The make-up of high school resources available to students influence college enrollment and the type of postsecondary educational program (e.g. two-year, four-year college, or certification program) the student selects (Engberg & Wolniak, 2010). A program evaluation of the resources available at each school, along with educator attitudes about postsecondary enrollment may result in a list of resources that assist with college enrollment that would be valuable for educators to use in their practice.

A systematic implementation of resources is needed so that all students may benefit from postsecondary enrollment assistance. College readiness strategies can be used to guide students in their postsecondary education decisions, either in the classroom using specific college and career exploration exercises or through one-on-one guidance with a school counselor. In states like Washington, the High School and Beyond Plan is a
graduation requirement that begins in either seventh or eighth grade and requires school staff to lead students through career exploration and postsecondary education planning (OSPI, 2017).

In research reviewed for this study, social capital and cultural capital were used along with human capital to determine college enrollment predictors. Cultural and social capital data are not readily available to educators (Engberg & Wolniak, 2010, 2014; Rowan-Kenyon, 2007). However, cultural and social capital data may assist researchers and practitioners with discovering how a high school with low-SES is more likely to have graduates enroll at a postsecondary institution than a school with high-SES. Parent and peer discussion groups are needed to further investigate influences these groups have on students’ decision to enroll at a postsecondary institution immediately following high school graduation.

**Replication of the Current Study**

The literature review and the results of this study lend support for the further use of updated student data in determining immediate postsecondary enrollment. A repeat of this study to further separate school characteristics that have an impact on students’ postsecondary enrollment allows educators the opportunity to make changes that positively impact a student’s decision to enroll in a postsecondary institution immediately after high school. While educators cannot control for factors such as race, gender, SES, or family educational background, educators can change certain traits of schools and resources available at those schools.

Another important case for replication of this study is the potential impact upon educator training. Educational staff that work with high school students and their families
should be aware of the importance of school characteristics, not just student characteristics, when working with families. By training administrators about the school characteristics as a factor that leads to immediate student postsecondary enrollment, increased staff awareness will occur. When working with students and their families, staff can then approach postsecondary enrollment from a systemic individualized approach.

**Conclusion**

It is important for stakeholders (i.e. teachers, counselors, principals, school board members, etc.) to explore why the variables in this paper can be predictive of postsecondary enrollment. This creates opportunities for educators to put policies and systems in place to ensure that all students have access to postsecondary information. Educators can use guidelines such as the ones from AASA (2016), ACTE (2010), and EPIC (2012) to set standards for graduates leaving the K-12 education system and pursuing postsecondary training. Educators who have access to these guidelines can create curriculum relevant to their student body to ensure that students of all demographic and educational backgrounds have the most current information about accessing all postsecondary training options.

Continued focus on college readiness and academic preparation for students will allow for successful access to postsecondary education. Educators providing access to information regarding college costs and how to access federal financial aid will assist students with making a cost-effective postsecondary plan. Both educators and researchers should focus their resources and research on the high school environment as well. Through professional development and use of updated research, educators should make shifts in the high school environment that will increase opportunities for all students to
access postsecondary education.
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