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The Effect of Tuition on Graduation Rate at Community Colleges

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THE EFFECT OF TUITION ON

GRADUATION RATE AT COMMUNITY COLLEGES

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ABSTRACT

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The community college mission has long included open access through low tuition (Vaughan, 2006). Financial challenges for community college students threaten open access (Shannon & Smith, 2006). Paying tuition plays a part in a student's ability to graduate. A community colleges' success is measured in part by graduation rates. President Obama challenged all colleges, including community colleges, to increase their graduation rates 50% by the year 2020 (Obama, 2009). The current study analyzed whether public, community colleges' tuitions predicted their graduation rates using recent data and if size of enrollment moderated the relations between tuition and graduation rate. A two-block, hierarchical regression analysis was used for the current study. This study controlled for size of enrollment, percentage of students receiving Pell Grants or other federal grants, percentage of students receiving loans, and percentage of students from non-dominant groups. Integrated Postsecondary Education Data System (IPEDS) data from 2012 were used for the present study. The goal of this study is to inform state and federal policy makers as well as community college leaders and practitioners and, also, fill the gap in knowledge for researchers concerning the question of whether tuition predicts community college graduation rate community colleges especially in the context of size of enrollment.

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Chapter I

Introduction

The following chapter includes the background of the current study and statement of the problem of the study. Also, within this chapter are the purpose of the study as well as the research questions. Included in this chapter is the significance of the current study and an overview of the methodology. Also, this chapter contains the conceptual model as well as the delimitations. This chapter consists of the definition of terms and the organization of the study.

Background

In 1947, the Truman Commission realized many insights concerning higher education including the cost of education could prevent student access to education (Gilbert & Heller, 2013). The Truman Commission wanted free community college tuition funded mostly by local governments and subsidized by state governments (Gilbert & Heller, 2013). This initiative has faded as a policy focus as state funding for community colleges has slowly decreased (Dougherty & Townsend, 2006; Dowd, 2003; Sullivan, 2010). While open access to community colleges through low tuition has long been a mission of community colleges (Shannon & Smith, 2006; Vaughan, 2006), financial challenges and rising tuition for community college students have threatened the mission of open access (Shannon & Smith, 2006).

Tuition has a direct link to educational access at community colleges (Dowd, 2003; Sullivan, 2010). Higher educational institutions have undertaken high tuition, high financial aid policies (Sullivan, 2010). These policies have been found to reduce access for low-income families at community colleges (Dowd, 2003; Rothstein, 2004; Sullivan, 2010). Low-income families are negatively impacted by high tuition, high aid policies, in part, because of their lack of understanding of the aid available (Dowd, 2003).

The national average for tuition and fees increased 427% between 1980 and 2008 for in-state public community colleges (United States Department of Education, National Center for Education Statistics, 2008). In 1992, low-income families needed 50% of their income to pay for tuition, while high-income families need 6% of their income or a difference of 44% (National Center for Public Policy, & Higher Education, 2006). In 2005, low-income families needed 58% of their income to pay for tuition at community colleges, while high-income families needed 7% of their income or, in other words, a difference of 51% (National Center for Public Policy, & Higher Education, 2006). This increased disparity represents, among other things, a rise in tuition and a barrier to the open access mission of community colleges especially for low-income students. An outcome measure for community colleges, such as graduation rate, could potentially be negatively impacted by such a rise in tuition.

Community colleges nationwide have an average three-year graduation rate of approximately 20% (National Center for Education Statistics, 2010). This is comparatively lower than four-year institutions who have a 6-year graduation rate of 60%, on average, nationally (National Center for Education Statistics, 2010). President Obama proposed, in 2009, the American Graduation Initiative (AGI) which called upon the nation's community colleges to increase their number of graduates and program completions by 5 million students as of 2020 (Obama, 2009). Meeting this challenge would equate to a 50 percent increase in the number of concurrent graduates (Obama, 2009). The funds for AGI never fully materialized yet the resulting goals for the number of graduates remained (Boggs, 2012).

Students must pay for tuition using a number of different means. Researchers have found that receiving financial aid, specifically Pell grants, state grants and loans, has different but significant effects on the likelihood of a student completing a degree (Dowd & Coury, 2006;

McKinney & Burridge, 2015; Mendoza, Mendez, & Malcolm, 2009). Specifically, taking out loans negatively impact the potential of a student persisting or completing a degree (Dowd & Coury, 2006; McKinney & Burridge, 2015; Robb, Moody, & Abdel-Ghany, 2012).

Colleges and universities began to receive an increase in pressure to begin controlling costs when President Obama, in 2013 requested of Congress an amendment to the Higher Education Act of 1965 (Holter & Seganish, 2014). Specifically, the request included affordability and value to be included in the determination of which colleges received certain future federal aid (Holter & Seganish, 2014). The affordability of college was also instrumental in President Obama's 2015 call for a plan making community college free for select students (Stratford, 2015). President Obama's plan referred to Republican Governor Bill Haslam's Tennessee Promise program and Democratic Chicago Mayor Rahm Emanuel's free community college program (Stratford, 2015). The potential of free tuition as well as maintaining the mission of open access at community colleges are important when considering graduation rates.

Raikes, Berling, and Davis (2012) conducted a study of how tuition predicted the graduation rate for the member institutions of the Council for the Christian Colleges and Universities (CCCU). The study found that the higher the tuition the higher the graduation rate for an institution (Raikes, Berling, & Davis, 2012). Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) conducted a study, using 2002-2003 IPEDS data, on community college graduation rates finding tuition had no significant impact. Community colleges and their students' completion rates have been studied in some detail with regards to loans and Pell Grants and specifically how those loans and Pell Grants affect non-dominant racial students and low-income students.

As of 2014, the tuition for the average community college student continued to be almost one third of the tuition for the average four-year, public institutional student (The College Board, 2014). However, covering tuition and non-tuition expenditures was nearly impossible to manage for the majority of community college students without taking financial aid (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). Many full-time community college students received Pell Grants but needed other means to cover the tuition. Even though community college students were less likely to utilize loans in comparison to four-year students, community college students found themselves in more drastic financial hardships. These hardships were especially poignant for low-income and/or students from non-dominant groups (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015).

Chen and Desjardins (2010) found students receiving Pell Grants, in particularly minorities, were less likely to drop out of college when receiving Pell Grants. The effect was larger when Pell Grant money covered increasingly more of tuition for each student (Chen & Desjardins, 2010). Students considered low-income, also, were not as likely to drop out when receiving Pell Grants (Chen & Desjardins, 2008). Hicks, West, Amos, and Maheshwari (2014) also found that decreases in Pell Grant funding reduced degree completion.

Statement of the Problem

The community college mission has long included open access through low tuition (Vaughan, 2006). Financial challenges for community college students threaten open access (Shannon & Smith, 2006). Paying tuition plays a part in a student's ability to graduate. A community colleges' success is measured in part by graduation rates which are a reflection of its students effectively completing a degree programs. President Obama challenged all colleges, including community colleges, to increase their graduation rates 50% by the year 2020 (Obama,

2009). A community college's graduation rate is affected by the types of financial aid its students receive. Past studies have shown how receiving loans and Pell Grants affect a student's ability to complete a degree and, thus, how receiving loans and Pell Grants affect the graduation rate of that student's community college. A community college's graduation rate can be affected by the tuition. Past studies have shown mixed results with a positive relationship between tuition and graduation rate at 4-year institutions (Raikes, Berling, & Davis, 2012) and a not significant relationship between tuition and graduation rate at 2-year institutions (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006). What is not known is if community colleges' tuitions predict their graduation rates using recent data and if size of enrollment moderates the relations between tuition and graduation rate.

Purpose of this Study

The purpose of the current study was to examine if tuition predicts graduation rate for the U.S. public community colleges after controlling for the size of enrollment, the percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, and the percentage of students from non-dominant groups for each institution. Additionally, the purpose of the current study was to determine if the size of enrollment moderates the relations between tuition and graduation rate for each institution. This study used 2012 IPEDS data.

Research questions

This study was guided by the following research questions:

1. Does tuition predict graduation rates at public community colleges after controlling for the size of enrollment, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of non-dominant group students?

2. Does the size of enrollment moderate the relations between tuition and graduation rates at public community colleges?

Significance of this Study

Community college tuition has been found to directly impact educational access (Dowd, 2003; Sullivan, 2010). Studies have shown that enrollments decline as tuition increases at community colleges (Ellwood & Kane, 2000; Kane, 1995; McPherson & Schapiro, 1991). Policies promoting high tuition offset by high financial aid reduce access for low-income families especially (Dowd, 2003; Rothstein, 2004; Sullivan, 2010). Recently, community colleges have considered graduation rates in the context tuition. Community colleges have historically low completion rates with a national average completion rate of 20% over a three-year period as of 2010 (National Center for Education Statistics, 2010). President Obama, through the American Graduation Initiative (AGI), challenged community colleges to increase their completion rates by fifty percent as of 2020 (Obama, 2009). Students receiving federal loans had significantly lower potential of completion of a degree program (Dowd & Coury, 2006; McKinney & Burridge, 2015; Robb, Moody, & Abdel-Ghany, 2012). Low-income and non-dominant group community college students had particularly drastic financial hardships when utilizing loans (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). Low-income and non-dominant group students receiving Pell Grants were less likely to drop out before completing a degree (Chen & Desjardins, 2008; Chen & Desjardins, 2010). State policy trends, especially concerning state grant aid, showed a need for improvement in state policy with regards to college affordability (Delaney, 2014). In his 2015 State of the Union Address, President Obama proposed alleviating this need with tuition-free, community college (Obama, 2015). One study conducted on how tuition affects graduation rate showed that the higher the

tuition, the higher the graduation rate for the member institutions of the Council for the Christian Colleges and Universities (CCCU) (Raikes, Berling, and Davis, 2012). Using 2002-2003 data, Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) found tuition had no significant impact on graduation rates. Therefore, there is a gap in the knowledge regarding whether tuition predicts graduation rate for America's community colleges when considering size of enrollment with recent data. In order to increase external validity, the U.S. public community colleges' size of enrollment was used. Cohen (1978) wrote that the best method for the disaggregation of community colleges was to do so according to size. Hardy and Katsinas (2007) found, according to the mean enrollment of rural, suburban, and urban community colleges, that these institutions are best divided into small, medium, and large colleges. The current study used size of enrollment to moderate the relations between tuition and graduation rate because size of enrollment is the best method to disaggregate community colleges.

Overview of the Methodology

The population for the current study was the public community colleges in the United States as defined by the American Association of Community Colleges. This study focused on the institutional level data for each community college as obtained from IPEDS for 2012. This was the last year for which the data were available.

The current study used a hierarchical regression analysis including an examination of institution enrollment size as a moderator of the relations between tuition and graduation rates. The reasoning for this methodology was its emphasis on explaining which independent variable was more important in the explanation of the variance in the outcome (Keith, 2006). Rather than comparing the relationship between means, as in an ANOVA analysis, this method of analysis is

best for predicting outcomes. For example, hierarchical regression analysis can help predict a community colleges graduation rate if the tuition is low or high.

Hierarchical regression uses step-wise entry of variables in an order specified by the researcher (Field, 2013). The current study utilized two blocks. The control variables— the size of enrollment, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of non-dominant students—were entered into the first block. The first block in hierarchical regression includes predictors which prior research has shown to most influence the dependent variable (Field, 2013). After a regression was performed of graduation rate on the first block of control variables, tuition was entered into the second block. The significance of the value of ΔR^2 was of most concern.

A moderation analysis was then performed to explore whether tuition predicts graduation rate at different sizes of enrollment. An interaction effect was created by multiplying tuition and size of enrollment together after each variable was grand-mean centered. This interaction effect was placed in the second block of a two-block hierarchical regression to determine the significance of the interaction. This was done using the SPSS plug-in Process. Process also conducts an analysis to determine if tuition significantly predicts graduation rate at low, medium, and high sizes of enrollment.

Delimitations

There are several delimitations included in the current study. The first delimitation concerns the level of analysis. The purpose of the institutional level of analysis, as opposed to student-level of analysis, is concerned with a couple factors including the fact that basic tuition was set by the state or for each institution as opposed to different tuition rates per student. The

results of the present study's institutional level of analysis are useful for determining institutional tuition rates as well as other policy measures.

Another delimitation concerns the use of a population rather than a sample size. The current study chose to exam the nation's community colleges as a whole rather than in part. However, using a population often yields too general of conclusions. For the current study, the community colleges' sizes of enrollments were used to moderate the relations between tuition and graduation rate in order to increase the external validity and to better generalize the results for community college policy makers and future researchers.

Finally, the unit of analysis was graduation rate. Community colleges utilize a great deal of varied measures of success such as transfer rates, certificate completions, dual enrollment numbers, workforce development certifications granted, etc. Graduation rate is not necessarily the best measure of community college performance. Graduation rate is, however, the unit of analysis most consistently used in the literature for measuring community college success as well as the most available unit of analysis for institutional level of analysis.

Definition of Terms

> **Graduation rate** is the number of full-time, first-time, degree/certificate-seeking undergraduate students graduating within 150 percent of normal time. Normal Time to Completion is the amount of time necessary for a student to complete all requirements for a degree or certificate according to the institution's catalog. This is typically 4 years (8 semesters or trimesters, or 12 quarters, excluding summer terms) for a bachelor's degree in a standard term-based institution; 2 years (4 semesters or trimesters, or 6 quarters, excluding summer terms) for an associate's degree in a standard term-based institution;

and the various scheduled times for certificate programs (U.S. Department of Education, National Center for Education Statistics, 2015).

Loans are the collection unsubsidized and subsidized loans a student receives from the federal Stafford Loan Program. Unsubsidized loans are not considered need-based and interest accrues on these loans that the student is responsible for paying. Subsidized loans are considered need-based and the U.S. Department of Education pays the interest, or subsidizes, the loan during certain periods (U.S. Department of Education, National Center for Education Statistics, 2015).

Percentage of students receiving loans is the percentage of full-time, first-time degree/certificate-seeking undergraduate students who received student loans. Loans to students - Any monies that must be repaid to the lending institution for which the student is the designated borrower. Includes all Title IV subsidized and unsubsidized loans and all institutionally- and privately-sponsored loans. Does not include PLUS and other loans made directly to parents (U.S. Department of Education, National Center for Education Statistics, 2015).

Pell grant is the money a student receives from the federal Pell Grant Program. The Pell Grant is money given to the student in proportion to his or her family income. The student is not responsible for repaying this money (Baime & Mullin, 2011).

Percentage of non-dominant students is the percentage of each school's population including all students identifying as either American Indian, Asian, Black, Hispanic, or Multi-Racial (U.S. Department of Education, National Center for Education Statistics, 2015).

Percentage of students receiving Pell grants or other federal grants represents the percentage of students at each community college receiving a Pell Grant or other federal grants (U.S. Department of Education, National Center for Education Statistics, 2015).

Size of enrollment is the total number of students entering at the undergraduate level (U.S. Department of Education, National Center for Education Statistics 2015).

Tuition is the tuition charged by the institution to those full-time undergraduate students residing in the locality in which they attend school. This may be a lower rate than in-state tuition if offered by the institution (U.S. Department of Education, National Center for Education Statistics, 2015).

Organization of the Study

The current study is separated into five chapters. The first chapter included the introduction consisting of the background of the present study, the statement of the problem, the purpose of the current study, the significance of the present study, an overview of the methodology, the conceptual model, the current study's delimitations, and the definition of terms. The second chapter consists of a review of the literature including the theoretical framework for the current study and a synthesis of the literature supporting the major constructs of the current study. The third chapter consists of the methodology for the current study including the purpose of the present study, the research design, the variables, the population, the instrumentation, the present study's data collection procedures, the data analysis and the limitations. The fourth chapter contains the results of the present study including correlations and descriptive statistics as well as the findings for research question one and two. The fifth and final chapter is the discussion section which includes a summary of the present study, a summary of the major findings, the findings related to the literature, implications for practice including

recommendations for practitioners and leaders, as well as recommendations for future research and the current study's concluding remarks.

Chapter II

Literature Review

The purpose of this quantitative ex post facto study was to determine if tuition predicts graduation rate for the United States public community colleges. In order to conduct such a study, an analysis of the literature regarding each component of the current study was necessary. The theoretical framework for the present study was based on research by Tinto (1993) as well as Pascarella and Terenzini (2005). Tuition, for community colleges, is established in several different ways by state and local governments. Understanding how students finance community college tuition requires an analysis of community college funding in a historical context. Historically, community colleges have attempted to keep tuition low to allow for the open access part of the mission of community colleges.

The current levels of tuition often act as a preventative to community college access (Sullivan, 2010). Recent trends revel this possibility (United States Department of Education, National Center for Education Statistics, 2008). Recently, graduation rates have become a major emphasis of community colleges. Also, different sources of aid provide students the ability to finance community college tuition. The finance of this tuition, by the student, requires the federal government to provide financial aid in the form of Pell Grants and loans. Obtaining this financial aid requires a specific process. State governments, also, provide forms of aid for community colleges students.

This literature review contains an analysis of this literature on the relationship between tuition and graduation rate, including persistence and degree attainment, as it is affected by a student's receiving financial aid. People from non-dominant groups who attend the community college and receive financial aid were examined. Also, this section focuses especially on

community college students who receive loans and/or Pell Grants. In this review, the literature on low-income community colleges students who receive financial aid was synthesized. Finally, the literature review contains research on how the size of enrollment of community colleges effects outcomes and further research.

Theoretical Framework

The theoretical framework for the current study was based in part on Tinto's (1993) Theory of Student Departure which outlined the several factors that have been shown to impact a student's ability to complete a degree from other research. Tinto (1993) developed this theory supported by the idea that students persist based on their integration into the institution. Tinto's (1993) theory insinuates that academic and social integration are keys to persistence and that financial aid is a part of effective integration. Tinto (1993) noted student persistence was constrained by financial factors. Tinto (1993) suggested that research "might then be posed as to the type of financial aid packaging that most enhances the likelihood of persistence" (p. 68). Loans have been shown to negatively impact a student's completion of a degree (Dowd & Coury, 2006; McKinney & Burridge, 2015; Robb, Moody, & Abdel-Ghany, 2012; Tinto, 1993). Grants, such as Pell Grants, have been shown to positively impact a student's completion of a degree (Chen & Desjardins, 2008; Chen & Desjardins, 2010; Tinto, 1993). The current study was focused, in part, on finding how loans and Pell Grants impact degree completion at the institutional level in the form of graduation rates.

Pascarella and Terenzini's (2005) General Model for Assessing Change addressed a college's uniqueness with regards to influences on students' cognitive development. They wrote that financial considerations mediate the effects of an institution's academic and social influences on students and subsequently their likelihood of persistence and degree completion.

They wrote that tuition has varying effects on the likelihood of persistence of different subcategories of students. The current study subcategorized the effect of students receiving loans and Pell Grants as well as non-dominant group students. Pascarella and Terenzini (2005) wrote that tuition has different effects on students from public and private institutions. The current study focused on public community colleges and their size of enrollment.

Tinto's (1993) research was important for understanding the financial factors relative to tuition's effect on graduation rates. Pascarella and Terenzini's research provided context for how the size of enrollment of the institution influences the predictive nature of tuition for graduation rates. Further review of this literature requires a synthesis of the literature regarding financing community colleges from a historical perspective especially regarding keeping tuition low for access and as part of the mission of the community college. Also, the next section covers tuition and access to community colleges and trends in community college tuition.

Financing Community Colleges

An historical perspective on community colleges brings a clear understanding of the financing of these institutions. Historically, community colleges have attempted to keep tuition low. This attempt has been a longstanding part of the open access mission of community colleges. Tuition has been shown to be a preventative to the open access mission of community colleges. Recent trends reveal this to be the case. Recently, graduation has become a focus of community colleges especially in the context of tuition.

Historical perspective. Earlier versions of community colleges existed before the extensive expansion of the 1960's and 1970's (Dowd & Shieh, 2013). In 1907, the California Legislature passed the Caminetti Act which was the first legislation to authorize the state funding of junior colleges as extensions of public high schools (Witt, Wattenbarger, Gollattscheck, &

Suppiger, 1994). Ultimately, this legislation was vetoed by the governor. However, the Ballard Act of 1917 was signed into law and it authorized funding allocation based on the same per-student rate of funding allocated for the public schools of the district establishing the junior college (Witt, Wattenbarger, Gollattscheck, & Suppiger, 1994). The better funded a community college is then students need to make up less operational costs.

As a national average for community colleges, the percentage of operational support provided from student tuition and fees was 6% in 1918 and increased to 26% in 2007 (Tollefson, 2009). Federal funding, as part of the national average operating budget, began as zero percent in 1918 and rose only to 8% as of 2007. State funds provided 47% if operational budgets as a national average as of 2007. Local funding began as 94% of the national average operating budget in 1918 but decreased to 19% as of 1997 and 8% as of 2007 (Tollefson, 2009).

The U.S. Constitution implies the power which affects public education, including community colleges, lies primarily with state and localities (Tollefson, 2009). When the Servicemen's Readjustment Act of 1944, or G.I. Bill, passed and the report of the President's Commission of Higher Education for Democracy was released in 1947, community colleges began to grow as states began funding autonomously from the federal government (Mullin & Honeyman, 2007). This autonomy came from the lack of the Constitution clearly delineating federal influence on education (Mullin & Honeyman, 2007). Eventually, the federal government did begin to exert its influence on education through funding.

The Higher Education Act (HEA) of 1965 gave the federal government influence on community colleges via funding (Dowd & Shieh, 2013). As of 2011, Title IV of the HEA (Higher Education Act of 1965, 20 U.S.C. 1070a) aided contributions representing 21.5% of federal financial aid through Pell Grants. Grants based on performance account for 7.4% of

money allocated. These grants are provided through the following programs: Title III of HEA, Strengthening Institution grants, and Title V of HEA which aids Hispanic Serving Institutions (Dowd & Shieh, 2013; Higher Education Act of 1965, 20 U.S.C. 1057-20 U.S.C. 1063c; Higher Education Act of 1965, 20 U.S.C. 1101-20 U.S.C. 1102c). States exert a more autonomous influence on community colleges.

States exert their funding autonomy through three different patterns of funding historically (Mullin & Honeyman, 2007).

- As of 1956, states funded community colleges through the following patterns: the state legislature funding the community college directly; the state allocating the flat grant fixed amount based on each headcount; and the flat grant which equalized minimum support.
- As of 1976, four different funding types emerged: negotiated budget funding, unit-rate formulas, minimum foundation funding, and cost based program funding.
- Current community college funding is best understood in historical context, and many states today utilize funding formulas, including performance-based funding, to fund community colleges.

Much of these funding formulas rely on performance basis but some still depend on full-time equivalent students as well as several other combinations (Mullin & Honeyman, 2007). Community colleges set tuition based on many factors including how much funding they receive for the federal or state government.

This section contains a review of the literature on how community colleges have been funded historically which has in many cases affected the tuition. This section also contains a review of literature of the Higher Education Act which gives the government the tools to assist, in part, non-dominant groups as well as other groups through mechanisms such as the Pell Grant.

Community colleges have historically focused on keeping tuition low so the open access mission for community colleges could remain.

Keeping tuition low for access. The Presidents Commission on Higher Education, also known as the Truman Commission, provides many insights about the path of thinking concerning higher education in the United States beginning at the end of World War II and continuing to the present day (Gilbert & Heller, 2013). The Commission was able to realize, as early as 1947, that cost was a preventative to higher education. The first initiative, resulting from the Truman Commission was the G.I. Bill which was incredibly impactful but only available to veterans (Gilbert & Heller, 2013). The G.I. Bill, not only helped provide access for veterans of World War II as well as later veterans, but it reinforced in the generation born to these veterans that future success most likely required college education (Vaughan, 2006).

The Truman Commission determined human resources provided America with potential and needed to be discovered and developed (Sullivan, 2010). The best method to do this would be to provide access through expanding higher education availability with an increased number of community colleges (Gilbert & Heller, 2013). This expansion was largely achieved in the 1960's, as a result of Johnson's Great Society, when the number of community colleges jumped from 412 to 497 institutions (Mullin & Honeyman, 2008).

Part of the Truman Commission's recommendations included picturing vastly different tuition structures than those available at the time (Gilbert & Heller, 2013). The Commission wanted community college tuition to be free so that higher education was as accessible for community college students as for students found in the K-12 school system. Unfortunately, the Commission envisioned the funding for free tuition to come from local governments and supplemented by state governments (Gilbert & Heller, 2013). However, community college

tuition has increased as a result of decreased state funding (Dougherty & Townsend, 2006; Dowd, 2003; Sullivan, 2010).

The mission of the community college. Vaughn (2006) wrote that most community colleges have a mission including "serving all segments of society through an open-access admissions policy that offers equal and fair treatment to all students" (p. 3). The three things that contributed to community colleges achieving open-access were the G.I. Bill, the civil rights movement, and the political and social activism of the 1960s and early 1970s bringing a federal commitment to increasing financial aid to higher education. This activism led to the Higher Education Act of 1965, its 1972 amendments, and later federal legislation, which provided financial aid to anyone wanting to attend college (Vaughan, 2006).

Community colleges enroll many non-dominant undergraduates of which many come from low-income and educationally disadvantaged backgrounds (Shannon & Smith, 2006). These students benefit from the open access mission of community colleges. Financial challenges to community college students threaten open access (Shannon & Smith, 2006).

Open access, as in nonselective enrollment and low-cost tuition, is threatened by limited educational opportunity for students from less-privileged background and a decline in the affordability of college (Dowd, 2003). Two-year institutions' tuition has increased, but four-year institution tuition has increased more dramatically. Four-year institutional tuition increases only magnify low-income and disadvantaged students need for access to two-year colleges. Despite the open access mission, community college tuition has risen and need-based aid has declined creating major barriers for low-income students (Dowd, 2003). Tuition can affect student access to community colleges.

Tuition and access. Tuition has been found to be linked directly with access to education at America's community colleges (Dowd, 2003; Sullivan, 2010). From 1980 to 2008, the average tuition for in-state public two-year institutions increased dramatically as enrollment decreased (Sullivan, 2010). This tuition increase has been a result of public higher education policy makers adopting a high tuition, high aid strategy (Dowd, 2003; Sullivan, 2010). States are devoting less of their budget proportions to higher education forcing institutions to rely on tuition as a source of revenue (Page & Scott-Clayton, 2016).

The impact of high tuition, high aid policies has been particularly noticeable with low-income families (Sullivan, 2010). Family incomes have remained stagnant in recent years (Page & Scott-Clayton, 2016). Thus, high tuition and high aid policies have been found to reduce access for low-income families in particular (Dowd, 2003; Rothstein, 2004; Sullivan, 2010). Dowd (2003) wrote low-income families most likely see the price of tuition and are not appropriately informed about the financial aid available.

Accessing financial aid that is available is not automatic and families face barriers to college access due to lack of awareness of available programs and the complexity of the Free Application for Federal Student Aid (FAFSA) (Page & Scott-Clayton, 2016). Substantial amounts of students fail to apply for financial aid even though they are eligible. Estimates from the 2011-12 National Postsecondary Student Aid Study (NPSAS) reveal of the 30 percent of students who did not file a FAFSA, nearly one third of them would have qualified for a Pell Grant (Page & Scott-Clayton, 2016). Interventions aimed at preventing all information barriers, including financial, have proven effective at increasing college enrollment (Carrell & Sacerdote, 2013; Castleman, Arnold, & Wartman, 2012). The design and messaging of grant programs is a significant factor toward their positively influencing student outcomes (Page & Scott-Clayton,

2016). The effectiveness of the high-tuition, high-aid policies for financing college require efficient and effective financial aid programs and questions exist toward this point especially concerning how these policies prevent college access (Page & Scott-Clayton, 2016).

Denning (2017) found that reducing tuition increases enrollment at community colleges without reducing enrollment for four-year public institutions suggesting the reduction in price makes higher education more accessible for lower-income families. African-American freshman were more likely than white students to take advantage of lower tuition. All students who took advantage of increased access due to lower tuition did not lower graduation rates for the community colleges. Also, these students were just as likely to graduate from the four-year institutions to which they transferred (Denning, 2017).

Hill (2016) found income inequality to have contributed to increased tuition, increased spending, and greater financial aid at many colleges and universities. These institutions attempted to meet the demand of higher income students by increasing tuition to pay for an increasing amount of amenities. This practice is pricing out lower-income families, limiting access to higher education, and is an unsustainable model (Hill, 2016).

While Baird (2006) found tuition to have no significant effect on enrollment, several studies have found as tuition increased, enrollments have declined (Ellwood & Kane, 2000; Kane, 1995; McPherson & Schapiro, 1991). Concerns about tuition, fees, and other costs have been found particularly impactful on low-income youth (Ellwood & Kane, 2000; Kane, 1995; McPherson & Schapiro, 1991). Such concerns especially affected low-income students educational and career goals (Sullivan, 2010). These conditions of affordability and perceptions of community colleges negatively affect the mission of open access (Sullivan, 2010). The trends in community college tuition are worth considering.

Trends in tuition at community colleges. Between the 1980/1981 school year and the 2007/2008 school year, the national average for tuition and fees increased from $391 to $2,063, based on 2007 dollar values, for in-state public two-year institutions (Wei, Berkner, & National Center for Education Statistics, 2008). This change represents a 427% increase over this time period. The change in tuition from the 2000/2001 to 2010/2011 school years was lower than the previous two decades (Baum, Little, & Payea, 2011). However, after growing 6% a year from 1990 to 2016, tuition only grew by 1.9% through June of 2017 which matched overall inflation (Mitchell, 2017). Still, this represents a rising trend in tuition for public community colleges over the previous thirty years.

Several causes influence the trends in tuition. The number of colleges, both two-year and four-year, grew by 33% to 4,726 between 1990 and 2012 (Mitchell, 2017). However, the number of high school graduates only grew by 2% from 2010 to 2017 after growing 18% from 2000 to 2010. The fact that there are more colleges with fewer students has decreased the college enrollment by 4% from its peak in 2010 and decreases in enrollment have forced colleges to raise tuition. Also, Congress increased the amount of federal aid students can borrow which has allowed colleges to charge more tuition (Lucca, Nadauld, & Chen, 2016; Mitchell, 2017). Other factors have certainly influenced trends in tuition such as less aid budgeted by states for higher education (Page & Scott-Clayton, 2016).

Also, Lucca, Nadauld, and Chen (2016) found the availability of more financial aid was significantly correlated with increases in tuition. This effect was especially evident at community colleges and institutions with students having lower Estimated Family Contributions (EFC). Evidence of increased Pell Grant money was not a significant predictor of higher tuition (Lucca, Nadauld, & Chen, 2016).

In 1992, the percentage of income needed to pay for public two-year institutions for low-income families was 50% while high income families needed 6% of their income to pay tuition (National Center for Public Policy & Higher Education, 2006). This is a gap of 44%. In 2005, low-income families needed 58% of their income to pay tuition while high income families needed 7% of their income to cover tuition, or, in other words, a gap of 51% (National Center for Public Policy, & Higher Education, 2006). The rise in tuition represents an increasingly larger barrier to community college education for low-income families than high-income families.

Mullin and Honeyman (2008) conducted a study on the tuition differential between 4-year institutions and 2-year institutions. They found that when tuition was determined by the legislature, found in only California and Florida, the differential was highest. When tuition was determined by the individual institution, the differential was next highest representing an attempt at low-cost, affordable college options for those students. Mullin and Honeyman (2008) found the lowest differential and higher than average tuition for community colleges where a state board determined the tuition suggesting these states were not as concerned with the mission of low-cost, accessible post-secondary options for students. Recently, community colleges have focused on graduation especially in the context of tuition.

Recent emphasis on graduation. Community colleges, as of fall 2012, served 45% of all U.S. undergraduates (American Association of Community Colleges, 2014). From 2003 to 2009, sixty-six percent of U.S. community college students had not yet obtained a credential (The College Board, 2012). Of these students, twenty percent continued to be enrolled while forty-six percent left their community college without obtaining a credential (The College Board, 2012). In 2010, the federal government measured the graduation rates of community colleges by using the completion of the degree within three years or 150% of normal time (National Center

for Education Statistics, 2010). With an average three-year graduation rate of approximately 20%, community colleges nationwide have statistically low completion numbers compared to four-year institutions who have a 60% graduation rate on average, nationally (National Center for Education Statistics, 2010). In the year 2009, close to 400 community colleges posted less than 15% graduation rates (Schneider & Yin, 2012). There are several factors that influence community college graduation rates.

Porchea, Allen, Robbins, and Phelps (2010) found standardized achievement scores as well as high school GPA were significant, positive predictors of whether a student would receive a degree and/or transfer. Lukosius, Byron Pennington, and Olorunniwo (2013) conducted a study on the mere perception of a system of support as it regards the potential to graduate. The strongest predictor of graduation was a perception, among freshman, of strong academic support (Lukosius, Byron Pennington, & Olorunniwo, 2013). Martin, Galentino, and Townsend (2014) found that successful graduates had clear goals, self-empowerment, the ability to manage external demands, and strong motivation. Many non-financial factors influence graduation rate. Community college graduation rates have become a national focus.

President Obama, in 2009, proposed the American Graduation Initiative (AGI) which challenged community colleges to increase their number of graduates and program completions by 5 million students over 10 years (Obama, 2009). This achievement would represent a fifty percent increase in graduate numbers. President Obama requested a $12 billion investment in attempt to achieve this goal (Obama, 2009). While congress never fully delivered these funds, the AGI goals for community college degree completion remained (Boggs, 2012).

Part of the AGI realization came in the form of legislation known as America's College Promise (ACP) which President Obama announced in January of 2015 (Palmadessa, 2017). This

promise materialized into a bill submitted to Congress in the summer of 2015 as H.R. 2962. This bill raised critical attention to the value of higher education in the U.S. One of the most important parts of ACP was its commitment to free community college for students found eligible for the purpose of increasing, among other things, mobility economically and increase student's completion rates (Palmadessa, 2017). Many liken the current drive for free community college to the goal of free secondary education of the early 20th century (Toner, 2016). The focus of the ACP was community colleges as the best available path to the middle class for many people, however, the bill did not pass Congress due to several reasons (Palmadessa, 2017).

In his 2015 State of the Union address, President Obama called for tuition free community colleges to increase completion rates and meet AGI goals (Obama, 2015). President Obama referred to both the Chicago Star Scholarship and the Tennessee Promise Scholarship. Obama's plan was more in line with the Chicago Star scholarship (Stratford, 2015). Chicago's plan used eligibility requirements for each student such as not requiring English or math remedial courses (Fain, 2014). Also, the student was required to have a 3.0 GPA while in high school (Fain, 2014). President Obama required a 2.5 GPA for his plan and would allow half-time enrolled students as long as they were consistently working towards the completion of a degree (Stratford, 2015).

The Tennessee Promise plan used "last-dollar" aid initiative (Pierce, 2015). In other words, the student must utilize all other financial aid, including Pell Grants, state grants, and/or the HOPE scholarship, prior to using the Promise scholarship for the remainder of the tuition (Pierce, 2015; Trant, Crabtree, Ciancio, Hart, Watson, & Williams, 2015). The funding for the program came from $47 million in state general fund money and $300 million in lottery reserve money (Pierce, 2015). Tennessee Promise consists of more than a financial aid program because

students are provided a community-based mentor for required college admissions counseling and they must engage in community service as well as maintain a 2.0 GPA (Meotti, 2016). Tennessee Promise is based on the "Knox Achieves" free community college program from East Tennessee (Page & Scott-Clayton, 2016). Knox Achieves was found to increase community college enrollment but was inconclusive as to how it impacted persistence and completion (Carruthers & Fox, 2016).

Free community college programs are now offered in Rhode Island, San Francisco, New York, and Oregon (Lobosco, 2017). Arkansas, Minnesota, and South Dakota offer free community college for students getting degrees in high demand areas. Louisiana's Taylor Opportunity Program has covered student tuition for those meeting certain academic standards for years, although, in 2016-2017, Louisiana did not have sufficient funds to offer the scholarship (Lobosco, 2017). Such free community college programs as these have the potential to reduce or eliminate students' needs for loans as well as increase completion rates in response to AGI.

AGI outlines the Presidents focus on increasing graduation rates. Some responses to AGI has been several initiatives to eliminate the tuition for community college students. Community college students face unique circumstances in regards to the costs of higher education.

Community college students and the cost of higher education. In 2013, colleges and universities began to receive an increase in pressure to control costs when President Obama asked Congress to amend the Higher Education Act of 1965 (Holter & Seganish, 2014). Specifically, Obama asked for "affordability and value (to be) included in determining which colleges receive certain types of future federal aid" (Holter & Seganish, 2014).

On average, community college students pay a third of the tuition compared the tuition at the average four-year, public institution (The College Board, 2014). Financial aid was necessary for a majority of community college students to cover tuition and non-tuition expenditures (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). While affordable by most higher education standards, community colleges have forced many students to borrow in order to cover tuition.

Of today's community college students, almost 40% completed a degree while borrowing to cover tuition using private or federal loans (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). Community college students were less likely than four-year students to use loans. Community college students, in particular low-income students and students from non-dominant groups, were more likely to have financial hardships due to borrowing loans. McKinney, Mukherjee, Wade, Shefman, and Breed (2015) discovered the current support systems for community college students using loans was insufficient.

While some tuition policies come from individual institutions or state boards, many policies establishing tuition for public community colleges often come from state governments who also decide how much state grant aid is going to be allotted to community college students in any given year. Several studies have been performed on how receiving financial aid, in the form of Pell grants, state grants, and loans, affects the likelihood of whether a student will graduate or complete a degree program (Dowd & Coury, 2006; McKinney & Burridge, 2015; Mendoza, Mendez, & Malcolm, 2009). The amount of financial aid a student requires is based in part on tuition. Further review of this literature requires a synthesis of the literature regarding the sources of student aid as provided by the federal government, through the Pell Grant program and Stafford Loan program processes, and as provided by state governments.

Sources of Student Aid

Different sources of aid provide students with the ability to cover tuition for community college education. The federal government provides aid in two main forms. These are loans and Pell Grants. The process to receive this aid is important for understanding the barriers a complicated financial aid process provides for students. State governments, also, provide aid typically in the form of grants.

Federal government aid. The federal government has a long history with higher education playing a continuous and expansive role in the evolution of colleges and universities (Chen & St. John, 2011; Stewart, 2015). The federal government has not only funded higher education institutions but also the attending students through financial aid measures given directly to students (Baime & Mullin, 2011; Stewart, 2015). Policies governing financial aid were created to remove barriers facing students who might not be able to attend a college or university due to an already high financial burden on their family (Chen & St. John, 2011; Stewart, 2015).

The U.S. Department of Education's Federal Student Aid Division was created to provide students financial aid through federal programs (U.S. Department of Education, 2010). This division was focused on providing the necessary funding, through federal means, in order for all students who qualify to attend a college or university (U.S. Department of Education, 2010). A student was able to receive a financial aid package consisting of two measures. One measure was gift aid which was funds in the form of grants or scholarships which were not paid back by the student (U.S. Department of Education, 2011).

The other measure of financial aid was self-help which was given to the student in the form of work study or loans (U.S. Department of Education, 2011). Work study aid was

obtained by a student's working for the institution he or she was attending in order to pay off tuition as well as other expenses. Loans were acquired by the student to pay tuition costs but had to be repaid and with interest (U.S. Department of Education, 2011). For the purposes of the current study, the forms of financial aid of focus were Stafford Loans and Federal Pell Grant financial aid programs.

Pell Grant Program. The federal Pell Grant program has been in existence since 1972 (Baime & Mullin, 2011). As of the 2010-2011 school year, the program has served 3.5 million community colleges students. In the same year, almost 80 percent of Pell Grant recipients at community colleges had family incomes below 150 percent of the poverty level based on families of four having 2 children. Of those same recipients, 60.7 percent had incomes of less than 100 percent of the poverty threshold level. Community colleges enrolled student populations that were 44% African American and 52% Hispanic and of these populations 25.8% and 25.3%, respectively, lived in poverty. However, 46.3% of students receiving Pell Grants were white due to the majority of people living in poverty, 18.5 million people, being white. Pell Grant recipients must maintain satisfactory academic progress in order to keep their eligibility. Students are limited to 18 semesters of eligibility according to the Higher Education Opportunity Act of 2008. The maximum Pell grant award available ranged from $5,500, for students from families with an estimated family income (EFC) of $0 to $1 dollars, to $176 for students from families with an EFC of $4,617 (Baime & Mullin, 2011). Students find this funding necessary to complete a degree.

Stafford Loan Program. Stafford loans fall under the William D. Ford Federal Direct Loan Program (Direct Loan) (U.S. Department of Education, 2010). Stafford loans fall under two categories: subsidized and unsubsidized. Subsidized loans are considered need-based and

the U.S. Department of Education pays the interest, or subsidizes, the loan during certain periods. Unsubsidized loans are not considered need-based and interest accrues on these loans that the student is responsible for paying. For the 2011-12 award year, the interest rate for an unsubsidized Stafford loan was 6.8%. The maximum amount a student could borrow was based on the year the student was in school and whether the student was a dependent or independent classification (U.S. Department of Education, 2010). As the 2009-10 award year, 25% of all community college students receiving Pell Grants required loans in order to cover expense costs (National Center for Education Statistics, 2011).

Financial aid process. Financial need is the basis for the acquisition of Pell Grants and Stafford Loans with the exception of unsubsidized Stafford Loans (U.S. Department of Education, 2010). Estimated Family Contribution (EFC) is used to calculate a student's eligibility for federal student aid. EFC is calculated on the basis of the information a student enters into the Free Application for Federal Student Aid (FAFSA). Information reported in FAFSA concerns taxable and untaxed family income and size of a family especially the number of dependents attending college or technical school. A student's need is calculated by the EFC being subtracted from the cost of attendance (U.S. Department of Education, 2010).

In some cases, low-income families were not able and/or not willing to facilitate the financial aid process (Olson & Rosenfeld, 1984). This situation can result in a student's inheritance of his or her parent's low-income status. Many high school counselors are ill-informed, ill-equipped, and lack the time to assist students with the financial aid process. Financial aid officers at colleges and universities assumed students will be more aggressive when searching for and applying for financial aid, which can be an inhibition for low-income families (Olson & Rosenfeld, 1984).

Community college students, according to research, had the highest need with assistance in regards to the financial aid process (Davidson, 2015; King, 2006; Novak & McKinney, 2011). In many cases, students failed to start the financial aid process due to not having enough information and due to the complexity of the Free Application for Federal Student Aid (FAFSA) (Davidson, 2015). In an attempt to increase the number of those who complete FAFSA, the federal government has tried to simplify the application (Bergeron, 2009).

State government aid. In the past, states allocated higher education funds to the public institutions to allow them to maintain a lower tuition rate (Chen & St. John, 2011). In the early 1970's, a national report recommended states change from policies based on low-tuition to polices where students and their families share the cost with the state with the basis of need equalizing opportunity for lower-income students (Newman Commission, 1971). Pell Grants equalized this need until 1978 when the Middle Income Student Assistance Act (MISAA) (1978) passed which increased the eligibility threshold for receiving Pell Grants (Chen & St. John, 2011). This allowed more middle class students to receive Pell Grants leaving less funding for low-income students. After 1980, policies shifted to individual responsibility for financing higher education. Pell Grant funding decreased while subsidized loan availability increased. States shifted tuition responsibility off of taxpayers and onto students' families which resulted in an increase in tuition and a decline in state appropriations for higher education (Chen & St. John, 2011).

MISAA (1978) was ultimately replaced by legislation which based financial aid on merit in addition to the traditional needs-based financial aid (Heller, 2008; Stewart, 2015). Merit-based programs have become more prominent than ever before at the state and institutional level (Heller, 2008). During the 1998 award year, nearly $2.96 billion was allocated for financial aid

based on need, which increased to $6.08 billion as of the year 2009 (National Association of State Student Grant & Aid Programs, 2010; Stewart, 2015). During the same period, $717 million was allocated for merit-based programs in 1998 which increased to $2.37 billion in 2009. These changes represented only a 105.4% increases for need-based programs but a 230% increase for merit-based programs (National Association of State Student Grant & Aid Programs, 2010; Stewart, 2015). These changes led to the establishment of merit-based aid such as the Helping Outstanding Pupils Educationally (HOPE) Scholarship first established in Georgia (Trant, Crabtree, Ciancio, Hart, Watson, & Williams, 2015). This scholarship, as many state-issued, merit-based scholarships, aided primarily middle to high income families rather than lower socio-economic families (Trant, Crabtree, Ciancio, Hart, Watson, & Williams, 2015).

Financing higher education is an important factor in understanding the effect of tuition on graduation rates. This section contains a review of the literature regarding the mechanisms a student may utilize in order to cover tuition at a community college. The following section concerns community college tuition in the context of graduation rates, non-dominant students, low-income students, loans, Pell Grants, and size of enrollment.

Community College Tuition

Research showed tuition can have a significant relationship with graduation rates for four-year institutions (Raikes, Berling, & Davis, 2012). Some similar research from 2005 showed this relationship to not be significant for community colleges (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006). Community college tuition can have a unique effect on low-income students and students from non-dominant groups. Community college students are uniquely affected when trying to pay for tuition via loans and Pell Grants. Research shows the size of enrollment of a community college affects students' ability to pay for tuition.

Community college tuition and graduation rates. There are few studies that exist on the specific effect of tuition on graduation rate at community colleges. Raikes, Berling, and Davis (2012) conducted a study on the effect of tuition on graduation rate for the Council for the Christian Colleges and Universities (CCCU). Raikes, Berling, and Davis (2012) studied 80 colleges for which they obtained data available from internet sources, the institution's website, or contacting the institution directly. Archibald and Feldman (2008) concluded there was a need for quantitative measures of university performance that were simple; they found graduation rate to be key in measuring a university's performance. Also, colleges and universities suffer from a lack of transparency concerning disclosing information about their performance (Archibald & Feldman, 2008).

Raikes, Berling, and Davis (2012) conducted a study on CCCU-member institutions which have consistently lower graduation rates than the national average despite better retention rates. These lower graduation rates make such a study useful in relation to community colleges as community colleges have historically low graduation rates. The average five-year graduation rate of CCCU institutions is 46.5% in comparison to the 53.9% national average for four-year institutions in the U.S. (Raikes, Berling, & Davis, 2012). On average, the 3-year graduation rate for community colleges nationwide is 20% (National Center for Education Statistics, 2010). These low graduation rates made the utilization of the Raikes, Berling, and Davis (2012) study useful in regards to the nation's community colleges.

Raikes, Berling, and Davis (2012) utilized faith-related factors which are not relevant to the present study on public community colleges. Raikes, Berling, and Davis (2012) also used institutional factors such as percentage of full-time faculty and instructional expenditures per full-time study equivalency (FTE). Raikes, Berling, and Davis (2012) did use financial factors

such as average student debt load and percentage of students eligible to receive Pell grants as well as tuition which were also used for the current study. Similar variables were useful for the present study of community colleges. Finally, Raikes, Berling, and Davis (2012) utilized a three-block entry hierarchical regression analysis for their study. A similar analysis was most appropriate for the current study.

Bailey, Jenkins, and Leinbach (2005) wrote "families, who are investing sizeable amounts in increased community college tuition, want assurances that the colleges will provide educational returns that justify their cost" (p. 1). Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) conducted a study, using IPEDS data, on community college graduation rates. Bailey et al. (2006) found a negative relationship existed between completion and enrollment size. Community colleges with higher populations of non-dominant groups had lower graduation rates. Bailey et al. (2006) did include in-state tuition as a part of their analysis and found that tuition did not have a significant effect on graduation rate for community colleges. Bailey et al. (2006) used 2002-2003 IPEDS data and did not determine if the size of enrollment moderated the relation between tuition and graduation rate. Hardy and Katsinas (2007) found enrollment size to be the best method to disaggregate community colleges.

Raikes, Berling, and Davis (2012) found tuition to have a positive impact on graduation rates at four-year institutions in the CCCU. Bailey et al. (2006) also determined tuition had no significant effect on graduation rate at community colleges and suggested further study be conducted concerning graduation rates at those institutions. The tuition at community colleges, and students' ability to cover tuition, warrants research into its effect on a performance measure of the institution such as graduation rate. The following section covers the community college tuition in the context of non-dominant students.

Community college tuition and non-dominant students. Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) found community colleges with higher enrollments of non-dominant group students had lower graduation rates. Denning (2017) found recent reductions in tuition have allowed for increased non-dominant group student enrollments of especially African-Americans at community colleges in Texas. African-Americans, responding to lower tuition, were just as academically prepared and were graduating at similar rates than their peers (Denning, 2017).

Baylor (2016) found African-American and Latino students were much less likely to attend elite four-year public universities than their Asian and white peers. Twenty percent of white students and 31 percent of Asian students attended selective public four-year universities. However, only nine percent of African-American and twelve percent of Latino students were likely to attend a selective four-year public university. African-American and Latino students were far more likely to attend community college which traditionally have lower graduation rates. Fifty-six percent of Latino students, who were enrolled in public colleges, attended community colleges. Fifty-one percent of African-American students, enrolled in public higher-education institutions, were found to attend community colleges (Baylor, 2016).

Stagg (2017) found Hispanic students persisted at a significantly higher rate when they remained at the same Texas community college. Graduation rates for white student and Hispanic students were comparatively low. Hispanic students' graduation rates, however, were lower than White students' graduation rates (Stagg 2017).

Harmon (2013) found as the enrollment size of African-American students increases at two-year colleges in Ohio, the completion and graduation rates for that institution decreases. This relationship was especially apparent at urban institutions. Harmon (2013), also, found an

inverse relationship between African-American part-time enrollment and a community college's graduation rate.

Menges and Leonhard (2016) conducted a study on community college students' willingness to borrow student loans. They found all groups only moderately willing to borrow money but significantly more African-American students borrowed money than white students. Students of Latino heritage were less likely to be willing to borrow money in comparison to the rest of the groups analyzed in the study. Also, African American community college students' financial literacy scores were found to be significantly lower when compared to white students although. All students' financial literacy was comparably low (Menges & Leonhard, 2016).

Some community college students, comprising of many non-dominant and low-income students, required financial aid in order to cover their tuition (Chen & Desjardins, 2010; Chen & Desjardins, 2008). For these students, higher tuition requires the use of the several forms of financial aid. Race and ethnicity are important considerations regarding persistence and degree attainment.

The effect of receiving financial aid for African-American and Hispanic students on degree attainment, as well as drop-out risk, is an important consideration. Chen and Desjardins (2010) performed a study concerning the effect of receiving financial aid on the likelihood of dropping out for students of different racial backgrounds. They focused on students of different races at four-year institutions from a national sample. Chen and Desjardins (2010) discovered students who received Stafford and Perkins loans as well as students who received Pell Grants were more likely to be from non-dominant groups than white. Students from low-income households were more likely to receive grants, loans, and work-study aid. Race, ethnicity, and family income were found to have varying effects on students' dropout risks. Students who

received unsubsidized loans were less likely to drop out during the first year than in the sixth year (Chen & Desjardins, 2010).

Chen and Desjardins (2010) discovered the biggest challenge facing American higher education was the likelihood of persistence of non-dominant groups. Comparing groups of late twenty year olds, ten percent of Hispanic students and eighteen percent of African American students have a bachelor's degree (Education Resources Institute, 2004). Concurrently, a third of white students have at least a bachelor's degree (Education Resources Institute, 2004).

Students from non-dominant groups are more likely to use financial aid (Chen & Desjardins, 2010). Thus, these students are more susceptible to the effects of using loans and Pell Grants. The following section reviews the literature on low-income students who, also, find themselves in need of financing tuition (Soria, Weiner, & Lu, 2014).

Community college tuition and low-income students. Soria, Weiner, and Lu (2014) determined low-income as well as working-class background students had a significantly higher likelihood of engaging in financial aid choices as well as actions which were potentially harmful during the immediate timeframe as well as long-term. While federal and state funding for financial aid is being cut, the behaviors of students with regards to financial aid, were more important to ascertain (Soria, Weiner, & Lu, 2014). Students from low-income families were forced to make decisions with regards to financial needs rather than educational needs in college cultures that were socially stratifying (Soria, Weiner, & Lu, 2014). Robb, Moody, and Abdel-Ghany (2012) found students from low-income households, as opposed to middle- or high-income households, had a higher likelihood of reporting difficulties persisting particular in the context of debt. Such stratification is important to consider in the context of graduating for low-income students.

Shireman, Baum, and Steele (2012) found the perceptions of financial aid solutions were mixed. People were more focused on aiding those who have graduated but not on forgiving the graduated students' loans. Opposition to loan forgiveness affected low-income students' perceptions of educational value (Shireman, Baum, & Steele, 2012). Low-income students were also being price out of higher education (Hill, 2016). This is important to note as community colleges in areas of high unemployment had significantly lower enrollment rates implying that enrollments must become less cyclical (McKinney, 2017).

Liu (2016) analyzed three different policies and their varied effects on two-year and four year students including enrollment and completion. Liu (2016) found free-community colleges increased low-income students' completion rates more so than "Pay as you Earn" plans or loan forgiveness. Also, free-community colleges increased enrollment rates especially for students from lower-income quartiles (Liu, 2016).

Coria and Hoffman (2015) found financial aid to have a positive influence on academic achievement including completion for students using aid lower than $115 at a California community college. For students needing aid above $115, or low-income students, the positive effect was not evident. The study determined a tipping point existed where the gap between level of need and the level of aid was too significant to provide assistance for low-income students to succeed academically. Coria and Hoffman (2015) found increasing aid for low-income students requires additional support in order to be effective in positively influencing academic outcomes.

Chen and DesJardins (2008) found higher dropout risks were more consistent with low-income students but, controlling for other variables, work-study aid lowered dropout risk. Chen and DesJardins (2008) also determined student retention programs were in need of being

adjusted or established to reduce the dropout risks of low-income students. Low-income students had a higher likelihood of dropping out in their first year as opposed to later years. Finally, low-income students had a higher likelihood of dropping out when compared to students from middle-class family incomes. The Pell Grant aided in mediating this effect (Chen & DesJardins, 2008).

Low-income students were more likely to use loans (Chen & DesJardins, 2008). These students were, also, more likely to make poor decisions while using loans to cover tuition (Soria, Weiner, & Lu, 2014). Community college students receiving loans can have an effect on their likelihood to complete a degree thus affecting the community colleges graduation rate.

Community college tuition and loans. Dowd and Coury (2006) performed a study on how receiving financial aid, primarily loans, affects the persistence and degree attainment of community college students over a five-year period using regression analysis of a national sample. Dowd and Coury (2006) found loans had a negative effect on the persistence of community college students. Loans, which were taken in the first year of a student's college career, did not have a significant effect on the attainment of a degree. Dowd and Coury (2006) found students who used loans to cover tuition developed a negative view of the overall benefits of community college education. This negative view made students assess their self-efficacy in performing college work and assess the money-making potential after an investment in education (Dowd & Coury, 2006). Robb, Moody, and Abdel-Ghany (2012) found the burden of student loans caused students to be less likely to persist.

Other research posed opposite conclusions on how receiving financial aid affects a student's completion of a degree. Dwyer, McCloud and Hodson (2012) found student loan debt actually increases completion rates. Debt at low levels had the effect of aiding the student to

completion. Debt above $10,000 had the reverse effect and reduced completion rates (Dwyer, McCloud, & Hodson, 2012). Baker and Doyle (2017) also found borrowing to attend community college does not have negative effect on completion although it should be done with caution and students should be properly informed of the variables in taking out loans.

Wiederspan (2016) found borrowing loans significantly increased a student's ability to complete credits in the first year of school. Also, students who have access to student loans have higher levels of enrollment and higher levels of persistence at community colleges. His study also suggested borrowing had a positive effect on completing a degree. Implications from this study suggested community colleges needed to assist and educate their students on financial resources when loans are not available (Wiederspan, 2016).

Mendoza, Mendez, and Malcolm (2009) performed a study on the persistence of community college students who had received financial aid. Primarily, Mendoza, Mendez, and Malcolm (2009) focused on the Oklahoma Higher Learning Access Program (OHLAP). McKinney and Burridge (2015) conducted a study using similar variables from a national sample. McKinney and Burridge (2015) found those students who received financial aid were less likely to persist, while Mendoza, Mendez, and Malcolm (2009) found financial aid recipients were more likely to persist to their second year. Mendoza, Mendez, and Malcolm (2009) found students receiving only federal loans, or federal loans with grant aid such as OHLAP, had a significantly higher likelihood of persisting. Mendoza, Mendez, and Malcolm (2009) concluded receiving state government aid, such as OHLAP, significantly and positively predicted the persistence of a student. Those students receiving federal loans were less likely to persist (McKinney & Burridge, 2015). McKinney and Burridge (2015) concluded policies limiting the negative impact of loans were important for decision-makers.

The studies on the use of loans by community colleges students has resulted in mixed conclusions as mentioned here. Mendoza, Mendez, and Malcolm (2009) found loans to positively affect degree completion, while McKinney and Burridge (2015) found loans to negatively affect degree completion. The following section contains the review of the literature on Pell Grants impact on degree completion and thus graduation rate.

Community college tuition and Pell grants. Nearly two-thirds of full-time community college students received a portion of Pell Grant (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). However, eighty percent of those Pell Grant recipients found it necessary to use other methods to cover tuition not met by Pell Grants (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). McKinney and Burridge (2015) found those who received Pell Grants were more likely to drop out. Students receiving Pell Grants who were minorities were less likely to drop out when receiving larger Pell Grants (Chen & Desjardins, 2010). Whether or not a student was receiving Pell Grants was a good indicator of persisting or dropping out (Chen & Desjardins, 2010).

In 2011, Congress made changes to the Pell Grant which decreased completion rates for rural area community colleges in Virginia (Hicks, West, Amos, & Maheshwari, 2014). Under the new Pell Grant guidelines, the amount of the grant was reduced as well as the number of semesters available to students to receive the grant. Hicks, West, Amos, and Maheshwari (2014) found these changes to negatively impact community colleges with historically low-enrollment. Graduation rates in these rural areas were found to potentially be reduced by thirteen percent in response to lower Pell Grant funds. First generation, low-income students were found to potentially face decreased completion rates after already being ill-prepared for college and requiring development courses (Hicks, West, Amos, & Maheshwari, 2014).

Kennamer (2009) found from the 2000-2001 school year to the 2005-2006 school year, the Pell Grant award was increased dramatically. The positive impact of the Pell Grant on community colleges' retention ability was, however, lessened due to the increase in both enrollment and tuition (Kennamer, 2009). Kennamer, Katsinas, and Schumacker (2010) determined more research was necessary for a clearer understanding of the impact of rising tuition and persistence rates at America's community colleges.

Pell Grants, as a means of financial aid, had mixed results in their effectiveness at helping students graduate with a degree. McKinney and Burridge (2015) found Pell Grants to have a negative impact on graduation rates while Chen and Desjardins (2010) found Pell Grants to have a positive impact. Changes in Pell Grants (Hicks, West, Amos, & Maheshwari, 2014) as well as changes in tuition and enrollment size (Kennamer, 2009) have adversely affected the positive impact of Pell Grants on graduation rate. Pell Grants and loans are used by students at community colleges to cover the tuition. The following section reviews the literature specific to understanding community college tuition in the context of size of enrollment.

Community college tuition and size of enrollment. In order to increase the external validity of the current study, the U.S. community colleges were divided into distinct strata. Hardy and Katsinas (2007) found that "greater variability" within the types of institutions "exists among rural colleges" in comparison to suburban and urban colleges (p. 8). This distinction is important in relation to the establishment of policies and practices. Although there are a large number of rural community colleges, urban and suburban community colleges serve more than forty percent of U.S. community college students as a whole (Hardy & Katsinas, 2007). Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) found the lower the size of enrollment, the higher the graduation rate.

Cohen (1978) suggested the best method for the disaggregation of community colleges was to do so according to size. Staff and faculty, at rural community colleges, serve in many varied capacities with smaller curriculums than those of suburban or urban community colleges (Hardy & Katsinas, 2007). Hardy and Katsinas wrote "greater variation" exists within rural community colleges as opposed to suburban or urban community colleges (p. 8). This distinction is even greater considering race and ethnicity where rural community colleges have a white population of 74 percent and urban and suburban community colleges serve 45 percent and 54 percent white populations, respectively. Thus, urban and suburban community colleges have distinct dominant and non-dominant group representation (Hardy & Katsinas, 2007). The current study used size of enrollment to moderate the relations between tuition and graduation rate because size of enrollment is the best method to disaggregate community colleges.

Hardy and Katsinas (2007) found the mean enrollment for rural, or small, community colleges, was 5,812 students. The mean enrollments for suburban, or medium, community colleges and urban, or large, community colleges were 15,528 and 28,401, respectively. Subsequently, they recommend using this means for categorization. Ten thousand or less students represents a small community college. A medium college is represented by 10,000 to 20,000 students and a large college is represented by an enrollment greater than 20,000 students (Hardy & Katsinas, 2007). For the current study, the U.S. community colleges' size of enrollment was included and analyzed. Trends in enrollment help contextualize size of enrollment at each community college.

Enrollment for two year colleges increased rapidly between 2000 and 2010 but has since declined (Ma & Baum, 2016). Between 2000 and 2010, total two-year sector enrollment increased from 5.7 million to 7.9 million and full-time enrollment increased from 2.0 million to

3.3 million. From 2010 to 2014, community college share of enrollment declined from 29% to 25% for full-time undergraduate students. Community college students were more likely to enroll part-time so the disparity of total enrollment between states ranged from 12% in Vermont to 52% in Washington as of fall 2014 (Ma & Baum, 2016).

Hillman and Orians (2013) examined the community college enrollment demand and its correlation with unemployment rates. They found that as unemployment rate increases, full-time and part-time enrollment at the corresponding community college increased. Full-time enrollment increased more so than part-time enrollment as unemployment increased. Hillman and Orians (2013) studied micro- and metropolitan areas where enrollment increases responded more so to unemployment increases in metropolitan areas, and rural areas were not incorporated in the study.

This section contains research supporting the disaggregation of community colleges according to enrollment size as well as trends in enrollment nationwide. Separating the colleges in this manner yielded more generalizable results than simply urban, suburban, and rural (Hardy & Katsinas, 2007). However, high-enrollment, urban community colleges' unique qualities require a review of the literature in the context of their tuition and graduation rates.

High-enrollment community colleges. Community colleges from high enrollment, urban areas face circumstances unique to most community colleges. Linderman and Kolenovic (2013) discovered 18 percent of City University of New York (CUNY) community college students typically had a minimum of one dependent and most of those dependents were under the age of five years old. Of CUNY community college students, 33 percent spent at minimum six hours a week giving care to other people. Seventy-five percent of the CUNY community college student population came from family incomes of less than $40,000. Linderman and Kolenovic (2013)

found 87 percent of these students began as full-time community college students but very soon changed to part-time status, significantly reducing their degree completion chances. These urban students face financial hardship in attending community college.

McKinney, Mukherjee, Wade, Shefman, and Breed (2015) conducted a survey at a community college in an urban setting in Texas. McKinney et al. (2015) found students receiving non-sufficient guidance and information about financial aid. McKinney et al. (2015) also discovered students had no option but to use loans and did feel their financial burden lifted somewhat from receiving loans, but predicted later personal stress regarding the loans. The high counselor-to-student ratio for these students did not alleviate the lacking financial literacy education they received (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). Research showed the negative impact receiving loans had on degree completion (Dowd & Coury, 2006; McKinney & Burridge, 2015; Robb, Moody, & Abdel-Ghany, 2012). The limited financial literacy and increased financial hardship of urban community college students makes the need for loans especially challenging.

High-enrollment and urban community colleges face unique challenges. This is especially important in the context of financing the tuition at these community colleges. At the same time, however, tuition can also have a significant effect on the graduation rates of low-enrollment community colleges serving rural areas.

Low-enrollment community colleges. Community colleges in rural areas typically experience low-enrollment as well as other definitive challenges. Hlinka, Mobelini, and Giltner (2015) found of the poorest counties in the U.S., five are located in eastern Kentucky and southern West Virginia. Of the residents in these areas, one in three live below the poverty line (Hlinka, Mobelini, & Giltner, 2015). From 2007 to 20011, merely 12.7 percent of high school

graduates in eastern Kentucky went on to complete college compared to the 28.2 percent national average during that same time (Appalachian Regional Commission, 2013).

Scott, Miller, and Morris (2016) found money was a significant barrier to rural area students considering whether to attend community colleges. Also, important to rural area students was options for higher education which reveals the importance of community colleges' roles in helping their communities in regards to limited available options. Many community colleges are beginning to make online options more available in order to increase their area of service (Scott, Miller, and Morris, 2016). Rural areas such as these have low graduation rates and low-income.

Hicks and Jones (2011) found state funding to be closely correlated to college enrollment. Enrollment in rural areas is low due to the population being sparse. While trying to utilize limited resources, colleges in rural areas are challenged when attempting to give the best quality education. Pell Grants help to alleviate some of the challenges faced by these rural area community college students (Hicks & Jones, 2011). Rural institutions face challenges to give a high quality education due to limited resources as a result of an inability to obtain money from the local government to develop resources (Hicks, West, Amos, & Maheshwari, 2014).

Low-enrollment, rural community colleges can, often, be identified by students with low-income (Hlinka, Mobelini, & Giltner, 2015). These community colleges must attempt to give quality education with few resources due to limited funding (Hicks & Jones, 2011) which can affect the colleges' graduation rates. Community college tuition influences the outcomes of a variety of students with diverse financial needs and circumstances.

Conclusion

This literature review contains research on financing community colleges. Specifically, it contains a review of the literature on the historical perspective on financing community colleges especially the keeping tuition low and the mission of community colleges. Tuition and open access are important to community college students as trends show. This review contains literature concerning sources of aid available to community college students including federal and state-level aid. Finally, this section contains a review of the literature on community college tuition particularly concerning graduation rates within the context of low-income and non-dominant groups, those students who receive loans and Pell Grants, and the size of enrollment of community colleges. The following chapter contains the purpose statement, research design, variables, population, instrumentation, data collection procedures, data analysis and limitation of the current study.

Chapter III

Methodology

The present study adhered, in part, to the quantitative ex post facto study performed by Raikes, Berling, and Davis (2012), who used a research design similar in nature to determine how tuition was related to graduation rate for all institutions within the Council for Christian Colleges and Universities (CCCU). This quantitative study examined community colleges and seeks to discover if tuition predicts graduation rate within community colleges. The current study focused on the public community colleges for the United States. This chapter presented the research design, population, instrumentation, data collection, data analysis, and limitations of the current study.

Purpose of this Study

The purpose of the current study was to determine if tuition predicted graduation rate for the U.S. public community colleges after controlling for the size of enrollment, percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, and percentage of non-dominant students for each institution. Additionally, the purpose was to determine if size of enrollment moderated the relations between tuition and graduation rate for each institution. The present study used 2012 IPEDS data.

Research questions

This study was guided by the following research questions:

1. Does tuition predict graduation rates at public community colleges after controlling for the size of enrollment, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of non-dominant students?

2. Does the size of enrollment moderate the relations between tuition and graduation rates at public community colleges?

Research Design

The current study used the study conducted by Raikes, Berling, and Davis (2012) as a model. Raikes, Berling, and Davis (2012) used a quantitative *ex post facto* design for their research to determine the factors, including tuition after controlling for other variables, which predict graduation rates for institutions within the CCCU. The current study used data from the Integrated Postsecondary Education Data System (IPEDS) located on the National Center for Education Statistics (NCES) website.

Ex post facto, in the literal definition, means "from what is done afterwards" (Simon & Goes, 2013, para. 2). Kerlinger (1964) wrote that *ex post facto* research is used when the independent variable, or variables, have previously occurred and thus the researcher begins with observing the dependent variable, or variables. The researcher retrospectively studies the independent variables' potential effects on and relations to the dependent variable and/or variables. In conducting *ex post facto* research, previously occurring variables are examined and these variables cannot be manipulated (Kerlinger, 1964). The independent variables in the present study were size of enrollment, percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, percentage of non-dominant students, and tuition. The dependent variable is the graduation rate for community colleges.

Variables

The independent variables for the present study included the control variables and the variable for whose effect is being controlled. The control variables were the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants,

the percentage of non-dominant students and the size of enrollment. The variable for whose effect was being controlled was tuition. The significance of the moderation was examined, in part, by creating an interaction variable composed of the product of the variables tuition and size of enrollment. The dependent variable for the present study was graduation rate. Graduation rate is a consistent outcome measure for studying community colleges.

Population

The population for the current study was the public community colleges in the United States. The list for this population was provided by the American Association of Community Colleges (2016) as well as the 2010 Carnegie Classification for each community college. Complete data were available for 769 community colleges. This population was chosen due to several factors. First, tribal community colleges were not part of the present study due to their uniquely small representation of total number of community colleges. As of 2015, tribal community colleges are unique in that they represent only 1 percent of the nearly 7.4 million community college students nationwide. Tribal community colleges represent three percent of all U.S. community colleges. Also, independent community colleges were not included in the population because very little research exists for these institutions and represent only eight percent of the total number of public community colleges. Public community colleges that fall under four-year institutions were not used either due to policy implications being different from community colleges that fall under a state's community college system. Special use community colleges were not used for the same reason. Finally, public community colleges were chosen because they represent nearly 90 percent of all community colleges (American Association of Community Colleges, 2015) and received between 40 and 45 percent of state funding as of 2004 (U.S. Government Accountability Office, 2004).

The unit of analysis for the current study was community colleges as institutions rather than the individual students of community colleges. The first reason for this is concerned with the guiding study of tuition's influence on graduation rate or completion rate which was performed by Raikes, Berling, and Davis (2012) who studied college affordability by examining institutions within the Council for Christian Colleges and Universities (CCCU). Also, a study of institutions as a whole, rather than a focus on individual students, was the primary means to study the largest sample of community colleges and the students they serve. High tuition and high aid policies have been found to reduce access for low-income families at community colleges in particular (Dowd, 2003; Rothstein, 2004; Sullivan, 2010), and President Obama challenged Congress to make community colleges tuition-free nationwide (Obama, 2015). These challenges require a study of public community colleges effectiveness through the measure of graduation rate as potentially predicted by tuition.

Instrumentation

The data collected for the current study came from one source. The source was the Integrated Postsecondary Education Data System (IPEDS) created by the National Center for Education Statistics (NCES) which is the principal statistical agency within the U.S. Department of Education. The NCES submits surveys to all higher education institutions nationwide and follows the 2012 Revision of NCES Statistical Standards to govern the survey designs (National Center for Education Statistics, 2012). Within these standards, the NCES (2012) utilizes an internal review process coordinated in the case by their Statistical Standards Program. IPEDS was used to collect data on the tuition, percentage of students using loans, percentage of non-dominant groups, percentage of students receiving Pell Grants or other federal grants, size of

enrollment for each community college, and graduation rates for each community college nationwide.

Data Collection Procedures

The data for the present study were collected by NCES and provided in IPEDS. IPEDS is the system NCES uses to collect and provide data on all higher education institutions (National Center for Education Statistics, 2016). Since 2012 is the most recent year for data provided, this is the year that was used for the current study's purposes. NCES collects data for IPEDS each year at different parts of the year. During the fall, 12-month enrollment components, institutional characteristics, and completions are collected (National Center for Education Statistics, 2016). During the winter, student financial aid, 20% graduation rates, graduation rates, and admission components are collected according to each institution (National Center for Education Statistics, 2016). In the spring, finance, fall enrollment, human resources, and academic libraries components are collected (National Center for Education Statistics, 2016).

The 2012 variable data used from IPEDS were chosen due to their being the most recent data, their importance in answering the research questions, and their availability. Tuition, graduation rate, size of enrollment, the percentage of students using loans, and the percentage of students receiving Pell Grants or other federal grants, each a continuous variable, were available in the original format. The percentage of non-dominant students per institution was created from adding the information provided for individual race groups.

Data Analysis

A two-block hierarchical regression analysis through IBM SPSS Statistics 22 software as well as the SPSS plug-in Process (Hayes, 2013) was used to analyze the data. The hierarchical regression method involves the addition of predictor variables to the model in order to determine

if the additional variables improve the model in question (Field, 2013). The current study consisted of a hierarchical regression of graduation rate on tuition after controlling for percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, percentage of non-dominant students and size of enrollment. Percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, percentage of non-dominant students and the size of enrollment were included in the first block. Tuition was included in the second block.

The first step in analyzing the variables included running a correlation analysis (Keith, 2006). If variables were deemed to be correlated too closely, an indicator of multicollinearity, in their relationship to graduation rate, then these variables would have been combined or one of the variables removed (Keith, 2006). After determining their correlation, percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, percentage of non-dominant students and size of enrollment were inserted into the first block of analysis with a 95% confidence level. Also, the box for Estimates was checked as a desired regression coefficient within SPSS. In addition, the boxes for Model fit and R squared change, or ΔR^2, were checked in SPSS as R squared change is part of the focus of this analysis.

A regression of these variables was performed on graduation rate giving a model summary, an ANOVA with the *F* statistic, and the regression analysis (Keith, 2006). The output of the regression of these variables on graduation rate was analyzed for significance. Significance was determined depending on if a *t*-test on the *b*'s shows $p<.05$. If the β was significant and positive, then this showed a direct relationship. If the β was significant and negative, then this showed an inverse relationship (Keith, 2006).

In the next step, the predictor variable for the current study's focus, tuition, was entered into block two. The significance of the first block of the regression was analyzed before tuition was inserted in the second block. If the first block's R^2 is significant, then the second block's R^2 would also be significant (Keith, 2006). Most important to determine was if the change in R^2 (ΔR^2) is significant (Keith, 2006). According to Field (2013), the significance of ΔR^2 is determined using the *F*-ratio from the following formula:

$$F_{\text{change}} = \frac{(N - k_{\text{new}} - 1)\,\Delta R^2}{k_{\text{change}}\,(1 - R^2_{\text{new}})}$$

The factor ΔR^2 is used in the equation to determine its significance. Also, it is important to notice the R^2 of the new model (R^2_{new}). The F_{change} equation must also account for the number of predictors that have changed (k_{change}) and how many predictors are in the new model (k_{new}) (Field, 2013). The *F*-ratio is used to compare the models according to the Akaike information criterion (AIC). The AIC must be compared to the other models using the same outcome variable. In this case, the smaller the AIC then the more the fit of the model is improving (Field, 2013).

If the ΔR^2 for block two was significant, then it could be determined that tuition was a significant predictor of graduation rate. The directional relationship between the variables depended on whether β was positive or negative. If β was positive, then the higher the tuition, the higher the graduation rate for community colleges. If the β was negative, then the higher the tuition, the lower the graduation rate for community colleges. The next step was to conduct the moderation.

The current study also included a moderation analysis which uses the combined effect of two variables (Field, 2013). In statistical terms, this combined effect is known as an interaction

effect. For the present study, an interaction effect was created by combining tuition and size of enrollment.

When this interaction effect is included in the model, the *b* parameters represent a specific meaning (Field, 2013). "For the individual predictors they represent the regression of the outcome on that predictor when the other predictor is zero" (Field, 2013, p. 398). In some cases, a predictor value of zero does not make sense. For this reason, predictors, in this case tuition and size of enrollment, are commonly transformed using grand mean centering. Centering the variables becomes important for making the lower valued *b*'s interpretable. Grand mean centering is achieved by subtracting the mean of a variable from each variable value (Field, 2013). Tuition and size of enrollment were grand mean centered.

After centering the variables, the interaction between tuition and size of enrollment required the creation of a new variable (Field, 2013). This new variable was made my multiplying $\text{tuition}_{\text{centered}}$ by size of $\text{enrollment}_{\text{centered}}$. The product of these two variables was the new variable interaction ($\text{tuition}_{\text{centered}} \times$ size of $\text{enrollment}_{\text{centered}}$). The order of predictor variable entry into the two-block hierarchical regression are represented by Figure 1.

Block 1	Block 2
$\text{tuition}_{\text{centered}}$ size of $\text{enrollment}_{\text{centered}}$ % of students receiving loans % of students receiving grants % of non-dominant students	$\text{tuition}_{\text{centered}} \times$ size of $\text{enrollment}_{\text{centered}}$

Figure 1. Order of predictor variables entry for moderation

The SPSS plug-in Process was used for the moderation. The output from the regression gave a *b* value for each variable. The *b* for each variable was compared to zero using a *t*-test. The *t*-test determined if the interaction effect contributed significantly to the variance in the model. Also, the confidence interval was produced for each *b* as a result of the output (Field, 2013). If the interaction effect was found to be significant, then more analysis was needed to be done to determine the nature of the interaction effect. This additional analysis included simple slopes analysis (Field, 2013). A regression was run for the mean size of enrollment, or average enrollment, for one standard deviation above the mean, or high enrollment, and one standard deviation below the mean, or low enrollment. The output from the moderation showed whether tuition was a significant predictor of graduation rate for size of enrollment at low values, mean values, and/or high values.

Limitations

As with all research, the current study had limitations. These limitations are avenues to further research which are discussed later. The first limitation concerned the study's design itself. Regression analyses are typically common to research performed for higher education. However, due to the fact that the design is correlational, cause and effect could not be conclusively determined. While the results might be predictive in nature, the conclusion that one of the independent variables directly caused graduation rate could not be assumed.

The second limitation was the level of analysis. The use of institutional data reduced the amount of data and the inferences that can be drawn from those data. Student-level data could provide possible conclusions for more specific parts of the community college student population. However, student-level analysis was too complex as a possible design for answering

the research questions in the current study. Also, student-level data for all public community colleges nationwide were not easily accessible while institutional-level data were at least more readily available. Regionalized student-level analysis might be recommendable for future research. The conclusions from such a study could be inferred more broadly.

Another limitation is that the present study did not use a prior achievement measure to help predict for graduation rate. This measure is helpful for determining how a student will succeed in college. This variable would have helped as a control variable to be entered in block one of the hierarchical regression. Community colleges typically use multiple measure to determine a student's college readiness and these measures do not always include SAT or GPA. Thus, these data were not available in IPEDS for community colleges.

Finally, the current study was limited to the measuring a community college's success by graduation rate. A community college's success is measured by several means including transfer rates, certification completion, dual enrollment, workforce development partnerships, as well as other performance-based measures. Graduation rate is, however, one of the most consistent. This was the most complete and appropriate measure of community college success available through IPEDS.

Conclusion

The purpose of the current study was to determine if tuition predicts graduation rate for the U.S. public community colleges after controlling for size of enrollment, percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, and percentage of non-dominant students for each institution. Additionally, the purpose of the present study was to determine if size of enrollment moderates the relations between tuition and

graduation rate. The present study used an *ex post facto* quantitative design. The data for the current study was collected from IPEDS and the National Center for Education Statistics. The most appropriate data analysis method was a hierarchical regression including a moderation analysis. The limitations have been mentioned in this chapter. The following chapter will review the results of the current study including descriptive statistics and correlations as well as the results from research questions one and two.

Chapter IV

Results

As stated in Chapter 1, the present study examined if tuition predicted graduation rate for the U.S. public community colleges. This chapter is organized according to the research questions. This chapter first reports descriptive statistics and correlations. Additionally, this chapter presents how well tuition predicted graduation rate after controlling for the size of enrollment, the percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants or other federal grants, and the percentage of students from non-dominant groups. Finally, this chapter provides data regarding whether the size of enrollment moderated the relations between tuition and graduation rate.

Descriptive Statistics and Correlations

Complete data were available for 769 colleges. Basic descriptive statistics are available in Table 1.

Table 1

Basic Descriptive Statistics

Variable	*M*	*SD*	Skewness	Kurtosis
Graduation Rate	.23	.12	1.54	3.83
Tuition	2461.11	1123.83	.74	2.57
Students Receiving Loans	27.56	22.43	.65	-.44
Students Receiving Grants	60.24	15.06	-.21	.49
Non-Dominant Group Students	.38	.22	.73	.04
Size of Enrollment	8553.60	11364.90	5.43	47.67

Table 2

Correlations

Variable	1	2	3	4	5	6
1. Graduation Rate	—					
2. Tuition	.11**	—				
3. Students Receiving Loans	.13***	.39***	—			
4. Students Receiving Grants	-.07	.00	.10**	—		
5. Non-Dominant Group Students	-.19***	-.35***	-.42***	.20***	—	
6. Size of Enrollment	-.19***	-.19***	-.09*	-.18***	.27***	—

Note. $*p < .05$. $**p < .01$. $***p < .001$

Correlations between all variables used in research question one are available in Table 2. Correlation analysis revealed some significant correlations among the variables. Graduation rate was significantly and positively correlated with tuition and percentage of students receiving loans. Furthermore, graduation rate was found to have a significant, negative correlation with the percentage of students from non-dominant groups and the size of enrollment.

Tuition was found to be significantly and positively correlated with the percentage of students receiving loans, and tuition was found to have a negative, significant correlation with the percentage of students from non-dominant groups and the size of enrollment. The percentage of students receiving loans was positively and significantly correlated with the percentage of students receiving Pell Grants or other federal grants. Also, the percentage of students receiving loans was negatively and significantly correlated with the percentage of students from non-dominant groups and the size of enrollment.

The percentage of students receiving Pell grants or other federal grants was significantly and positively correlated with the percentage of students from non-dominant groups, and the percentage of students receiving Pell Grants or other federal grants was negatively, significantly

correlated with the size of enrollment. The percentage of students from non-dominant groups was significantly and positively correlated with the size of enrollment.

Does Tuition Predict Graduation Rate at Community Colleges?

Hierarchical regression was used to examine whether tuition predicted graduation rate after controlling for the size of enrollment, the percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, and the percentage of students from non-dominant groups for each institution. The initial data were screened for extreme outliers and influential cases and were left unmodified. Analysis of residual and scatter plots revealed assumptions of normality, linearity, and homoscedasticity were all satisfied (Field, 2013). While an analysis of correlations between the variables revealed many significant correlations, for the purposes of regression, the assumption of multicollinearity was satisfied as the collinearity statistics, VIF and Tolerance, were deemed within accepted limits (Field, 2013).

In step 1, shown in Table 3, a regression of graduation rate on the size of enrollment, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of students from non-dominant groups for each institution, explained a significant 7% of the variance in graduation rate; F (4, 764) = 13.51, MSE = .01, p < .001. Adding tuition in the second block of the regression did not lead to a significant change in R^2 (ΔR^2 <.00, p = .86). In the final step, after controlling for the size of enrollment, the percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, and the percentage of students from non-dominant groups for each institution, tuition was a non-significant predictor of graduation rate (β <.00, p = .86). Size of enrollment, the percentage of students receiving loans, the percentage of students receiving grants, and the

percentage of non-dominant groups for each institution were found to be significant predictors of graduation rate.

Table 3

Summary of Hierarchical Regression for Variables Predicting Graduation Rate

Variable	*b*	B	*t*	95% CI	*R*	R^2	ΔR^2
Step 1					.257	.066***	.066***
Students Receiving Loans	.000*	.09*	2.22	.000, .001			
Students Receiving Grants	-.001*	-.08*	-2.12	-.001, -.000			
Non-Dominant Group Students	-.05*	-.10*	-2.25	-.09, -.01			
Size of Enrollment	-.000***	-.17***	-4.49	-.000, -.000			
Step 2					.257	.066***	.000
Students Receiving Loans	.000*	.09*	2.07	.000, .001			
Students Receiving Grants	-.001*	-.08*	-2.12	-.001, -.000			
Non-Dominant Group Students	-.05*	-.09*	-2.19	-.09, -.01			
Size of Enrollment	-.000***	-.17***	-4.43	-.000, -.000			
Tuition	.000	.01	1.77	-.000, .000			

Note. $N = 769$; *$p < .05$. **$p < .01$. ***$p < .001$

When all variables were entered into the second block of the regression, size of enrollment was found to be a significant, negative predictor of graduation rate ($\beta = -.17$, $p < .001$). For every one standard deviation increase in size of enrollment, graduation rate decreased .17 standard deviation. The percentage of students receiving loans was a positive and significant predictor of graduation rate ($\beta = .09$, $p = .04$). Every one standard deviation increase in the percentage of students receiving loans led to a .09 standard deviation increase in graduation rate.

The percentage of students receiving Pell Grants or other federal grants was a significant, negative predictor of graduation rate ($\beta = -.08$, $p = .03$). Specifically, every one standard deviation increase in the percentage of students receiving Pell Grants or other federal grants led to a .08 standard deviation decrease in graduation rate. The percentage of students from non-dominant groups was a significant, negative predictor of graduation rate ($\beta = -.09$, $p = .03$). For every one standard deviation increase in the percentage of students from non-dominant groups, graduation rate decreased .09 standard deviation.

Does Size of Enrollment Moderate the Relations between Tuition and Graduation?

The SPSS plug-in Process (Hayes, 2013) was used to examine if the size of enrollment moderated the relations between tuition and graduation rate. The original design of this moderation analysis included the control variables the percentage of students receiving loans, the percentage of students from non-dominant groups as well as the percentage of students receiving Pell Grants or other federal grants. Attempts to include the percentage of students receiving loans and the percentage of students from non-dominant groups - as well as the interaction effect, dependent and independent variables - in the moderation, made the regression singular. Thus, the percentage of students receiving loans and the percentage of students of students from non-dominant groups were removed. The moderation only included the percentage of students receiving Pell Grants or other federal grants as a control variable.

In the regression for the moderation model (shown in Table 4), after controlling for the percentage of students receiving Pell Grants or other federal grants, size of enrollment was not found to significantly moderate the relationship between tuition and graduation rate. The inclusion of the interaction effect ($\text{tuition}_{\text{centered}} \times \text{size of enrollment}_{\text{centered}}$) did not lead to a

significant change in R^2 (ΔR^2 =.02, p = .06). The interaction effect explained a non-significant 2% more variance in the outcome.

Table 4

Summary of the Regression for Moderation Model Including the ΔR^2

Variable	*b*	*t*	95% CI	*R*	R^2	ΔR^2
				.25	.07**	.02
Size of Enrollment$_{centered}$	-.0000028*	-2.42	-.0000051, -.0000005			
Tuition$_{centered}$	.0000062	1.42	-.0000023, .0000148			
Students Receiving Grants	-.0006949	-1.92	-.0013939, .0000041			
Interaction Effect	.0000000	-1.95	.0000000, .0000000			

Note. N = 769; *p < .05. **p < .01. ***p < .001

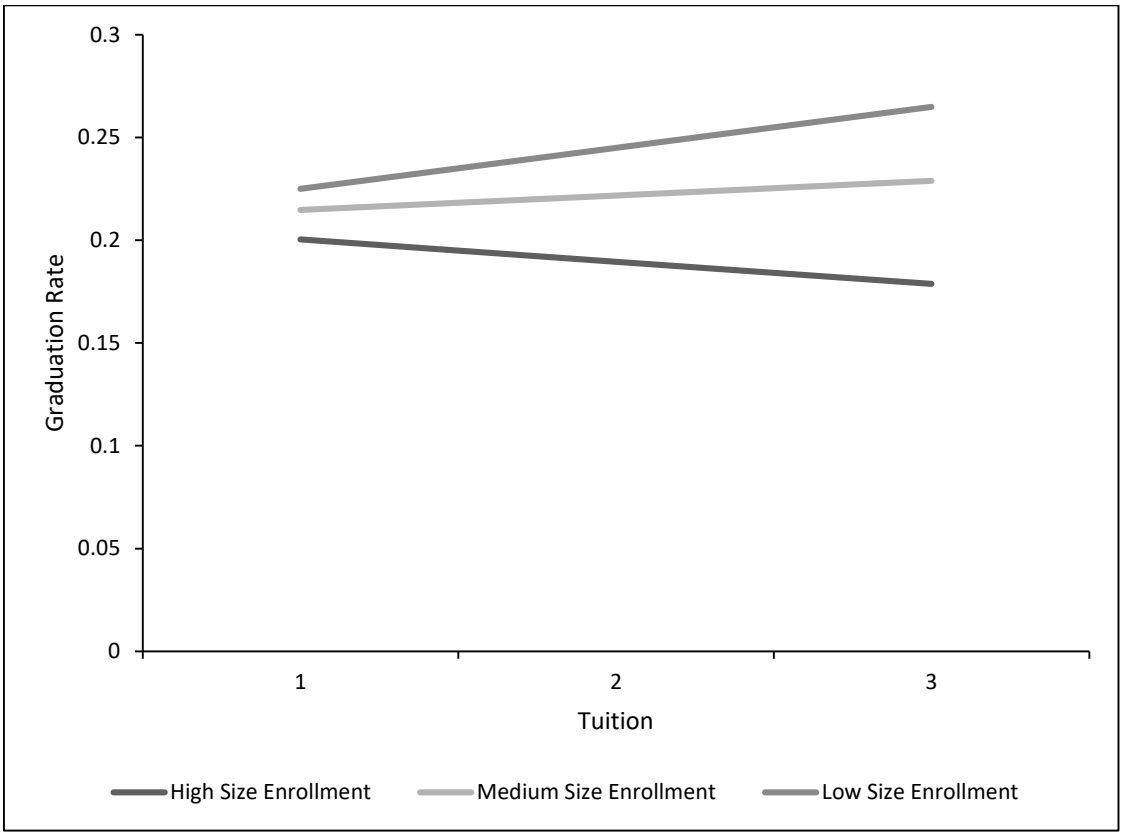

Figure 2. Simple slopes for tuition predicting graduation rate at values of size of enrollment. Note: The interaction effect (tuition$_{centered}$ × size of enrollment$_{centered}$) was p = .06.

Table 5

Conditional Effect of Tuition on Graduation Rate at Values of Size of Enrollment

Value of Size of Enrollment	Effect	*t*	*p*	LLCI	ULCI
-8177.51	.00001748	2.99	.002	.00000602	.00002895
Mean	.00000623	1.43	.154	-.00000234	.00001480
11415.04	-.00000948	-.89	.373	-.00003034	.00001138

Figure 2 shows the simple slopes for the moderation including how tuition predicts graduation rate at 1 SD below the mean of size of enrollment, the mean size of enrollment and 1 SD above the mean of size of enrollment. The moderation results, shown in Table 5, reveal that as values approached one standard deviation below the mean of the moderator (size of enrollment), tuition was a significant and negative predictor of graduation rate ($b < .001$, $p = .003$). At the mean value of size of enrollment, tuition was a non-significant predictor of graduation rate ($b < .001$, $p = .15$). For the value of the size of enrollment at one standard deviation above the mean, tuition was a non-significant predictor of graduation rate ($b < .001$, $p = .37$).

Conclusion

This chapter reported the study's descriptive statistics and correlations. This chapter, also, presented the results of how well tuition predicted graduation rate after controlling for the size of enrollment, the percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants or other federal grants, and the percentage of students from non-dominant groups. Finally, this chapter provided the results from the current study regarding whether the size of enrollment moderated the relations between tuition and graduation rate. The following chapter will reintroduce of the problem statement and purpose of the current study and also the research questions. Also, the next chapter will present a summary of the major

findings from research question one and two. The following chapter contains the findings of the current study related to the literature including any unanticipated findings. Furthermore, the following chapter contains the current study's conclusions including implications for practice, recommendations for leaders and practitioners, as well as recommendation for research to be conducted in the future. Finally, the following chapter provides concluding remarks regarding the entirety of the study.

Chapter V

Discussion

The following chapter presents a reintroduction of the topic as well as a summary of the major findings. Also, this chapter contains the findings related to the literature including unanticipated findings. Furthermore, this chapter contains conclusions including implications for action and recommendation for further research. Finally, this chapter gives concluding remarks regarding the study.

Summary of the Study

This following section presents an overview of the problem as well as the purpose statement and the research questions. Furthermore, this section contains a review of the methodology for the study. Also, the section presents a summary of the major findings.

The mission of community colleges has included for some time giving students open access through low tuition (Vaughan, 2006). Students face financial challenges, trying to cover tuition, which serve to jeopardize open access to community college education (Shannon & Smith, 2006). One measure of community college success is graduation rate which reflects a student's completion of a degree program. Students must pay tuition, often by using financial aid, in order to graduate. President Obama challenged all higher education institutions to increase graduation rates by 50% as of 2020 (Obama, 2009). The different types of financial aid a community college's students receive affects the college's graduation rate. Studies have shown receiving loans and Pell Grants to have an effect on a student's ability to complete a degree which affects the graduation rate of that student's community college. Tuition could have an effect on community college graduation rates. Past studies have shown a significant, positive relationship between tuition and graduation rate (Raikes, Berling, & Davis, 2012), and a non-

significant relationship between tuition and graduation rate (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2006). The current study sought to find if community college tuition predicted the graduation rate using recent data and if size of enrollment moderated the relations between tuition and graduation rate. The current study used size of enrollment to moderate the relations between tuition and graduation rate because size of enrollment is the best method to disaggregate community colleges.

The purpose of the current study was to examine if tuition predicted graduation rate for the U.S. public community colleges after controlling for the size of enrollment, the percentage of students receiving loans, percentage of students receiving Pell Grants or other federal grants, and the percentage of students from non-dominant groups for each institution. Additionally, the purpose of the current study was to determine if the size of enrollment moderates the relations between tuition and graduation rate for each institution. The current study utilized 2012 IPEDS data to address the following research questions:

1. Does tuition predict graduation rates at public community colleges after controlling for the size of enrollment, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of non-dominant group students?
2. Does the size of enrollment moderate the relations between tuition and graduation rates at public community colleges?

The population used for the current study was the public community colleges located in the United States as outlined by the American Association of Community Colleges (2016) and the 2010 Carnegie Classification for each community college. The institutional data of the

present study were found in IPEDS for 2012. This was the most recent year the data were available.

The present study used hierarchical regression analysis including an examination of whether size of enrollment moderated the relations between tuition and graduation rate. This methodology was chosen due to its focus on explaining which predictor variable was more important in explaining the causation of the relationship (Keith, 2006). Instead of comparing the relationship between means, such as ANOVA analysis, regression analysis helps predict outcomes. Hierarchical regression uses step-wise entry, which is determine by the researcher (Field, 2013). The present study used two blocks with the control variables - the size of enrollment, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of non-dominant students - entered in to the first block. After a regression of graduation rate on the control variables was entered in the first block, the variable of interest, tuition, was included in the second block and a regression was performed. The significance of ΔR^2 showed how much variance in the model is explained by tuition.

A moderation was then performed including an interaction between tuition and size of enrollment. For the interaction effect to be determined if significant, both tuition and size of enrollment needed to be centered and multiplied together. A regression was performed on all variables in the first block and then the interaction was entered into the second block of a hierarchical regression to determine if it was significant.

For the moderation, the current study used the SPSS plug-in Process (Hayes, 2013). When all of the control variables, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of non-dominant group

students, were entered, the regression was determined to be singular. When the percentage of students receiving loans and the percentage of non-dominant group students were removed, the moderation was successfully performed.

Summary of the Major Findings

For Research Question 1, when the control variables (the size of enrollment, the percentage of students receiving loans, the percentage of students receiving Pell Grants or other federal grants, and the percentage of students from non-dominant groups for each institution) were entered into the first block of the regression, they explained a significant 7% of the variance in graduation rate. Adding tuition in the second block of the regression did not lead to a significant change in R^2 ($\Delta R^2 < .00$, $p = .86$). Tuition was not a significant predictor of graduation rate.

Of the control variables, size of enrollment was a significant, negative predictor of graduation rate. The percentage of students receiving loans was a positive and significant predictor of graduation rate. The percentage of students receiving Pell grants or other federal grants was a significant, negative predictor of graduation rate. The percentage of students from non-dominant groups was a significant and negative predictor of graduation rate.

For Research Question 2, in the moderation, after controlling for the percentage of students receiving Pell Grants or other federal grants, size of enrollment was not found to significantly moderate the relations between tuition and graduation rate. The interaction effect only explained 2% of the variance where $p = .055$. Without assigning significance to the interaction effect and understanding that it only explains a small amount of variance, size of enrollment was very close to being a significant moderator of the relations between tuition and graduation rate. The results of the moderation showed that at low enrollment, or as values of

size of enrollment approached 1 SD below the mean, tuition was a significant, positive predictor of graduation rate ($b < .001$, $p = .003$). At the mean value and high value (1 SD above the mean) of size of enrollment, tuition was not a significant predictor of graduation rate.

Findings Related to the Literature

The current study supported, in part, Tinto's (1993) Theory of Student Departure which showed that integration into the institution was important for a student's ability to persist which can be done, partially, by removing financial barriers through financial aid. The current study found students receiving loans had a higher likelihood of graduating, which is most likely true for loans at lower amounts. The current study investigated Tinto's proposal for research regarding how different financial aid packaging affected a student's likelihood to complete. However, specifically, Tinto (1993) found receiving Pell Grants had a positive effect on completion and receiving loans had a negative effect on completion. The current study found the opposite of both of these findings to be true.

The current study, in part, supported Pascarella and Terenzini's (2005) General Model for Assessing Change which took into account a college's uniqueness as it influences a student's development. The current study found potentially significant results indicating, for low size of enrollment community colleges, the higher the tuition the more likely students will complete a degree. Pascarella and Terenzini (2005) also found financial considerations mediate the effects of an institution's academic and social influences on students and subsequently their likelihood of persistence and degree completion. The current study supports this theory with the finding that receiving loans had a positive effect on graduating and receiving Pell Grants had a negative effect on graduating.

The limited major findings of the current study have similarities as well as differences when compared to prior research on the topic. For research question one, the current study found that tuition was not a significant predictor of graduation rate. In contrast, the Raikes, Berling, and Davis (2012) study found tuition was a significant, positive predictor of graduation rate. Contextually, while both studies dealt with higher education institutions, the study was concerned with private, Christian colleges and universities while the current study was concerned with public, community colleges. The Raikes, Berling, and Davis (2012) study also had additional data points such as measures for prior achievement (i.e. SAT, GPA). These data were not available for the current study because community colleges do not require SAT scores and GPA for admission. Community colleges are different from Christian colleges and universities because Christian colleges and universities are typically private and serve a higher socioeconomic status of student than community colleges who have a large population of low-income students.

The current study did have similar results to the Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) study. They found tuition was not a significant predictor of graduation rate. These results are more accurately reflected in the current study because Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) studied community colleges and used 2002-2003 IPEDS data. The current study sought to analyze more recent IPEDS data from 2012.

The current study supported to some degree research by Mendoza, Mendez, and Malcolm (2009), Dwyer, McCloud and Hodson (2012), and Wiederspan (2016) which found that receiving loans can have a positive relationship with graduating. This could be explained in part by the findings of Wiederspan (2016) which indicated that students who had loans completed their initial community college credits at a higher rate. Also, this result could be due to the

positive effect of lower levels of student debt on the ability to graduate, specifically debt under $10,000 (Dwyer, McCloud & Hodson, 2012). Also, Mendoza, Mendez, and Malcolm (2009) found this effect was primarily true with federal loans. The current study did contradict the findings of Robb, Moody, and Abdel-Ghany (2012), McKinney and Burridge (2015) and Dowd and Coury (2006) which suggested receiving loans negatively impacted completion. These findings may be different because the more debt a student incurs might be a deterrent for that student wanting to persist to graduation.

Also, the findings of the current study supported part of the research by Kennamer (2009), Hicks, West, Amos, and Maheshwari (2014), and McKinney and Burridge (2015), which indicated receiving Pell Grants had a negative relationship on a student's ability to graduate. This could be due to the inability of Pell Grants to cover increases in tuition (Kennamer, 2009). This could, also be due to Federal changes in Pell which have decreased the amount of time a student can use Pell Grant money which has lowered graduation rates (Hicks, West, Amos, and Maheshwari, 2014). McKinney and Burridge (2015) attributed this effect to need-based grant aid not being sufficient enough to cover all community college costs especially as need-based grant aid eligibility is based on persons coming from the lowest income quartiles. The current study contradicts the findings of Chen and Desjardins (2010) who found that students who receive Pell Grants are more likely to complete a degree especially non-dominant group students. These findings may be different because Pell Grants can enable students to attend college, and possibly graduate, who otherwise might not have been able to do so.

Additionally, the current study supported results of the studies by Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006), Harmon (2013), Baylor (2016), and Stagg (2017), which found community colleges with higher enrollments of non-dominant group students had lower

graduation rates. Baylor (2016) found African-American and Latino students were far more likely to attend community colleges which traditionally have lower graduation rates. Harmon (2013) found community colleges with higher enrollments of African-American students had significantly lower graduation rates. Stagg (2017) found white and Hispanic students at Texas community colleges had low graduation rates, but Hispanic students graduate at lower rates than white students. Non-dominant group students at community colleges can represent a population requiring special attention by community college leaders and practitioners. While not representative of all non-dominant group students, many of these students are at-risk of dropping out although the effect is mitigated by receiving financial aid (Chen & Desjardins, 2010). Denning (2017) found that reducing tuition allowed for more non-dominant group students to enroll in college and begin graduating at the same rates as their peers. This was especially true for African-American students who were more likely than white students to access lower tuition, but also graduated at the same rates as their white peers (Denning, 2017). Community college leaders would do well to provide these students with sound financial aid literacy, academic and social support, and work with leaders in the community to fully support the student in all ways to prevent road blocks to degree completion.

The current study supported the research by Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) which found size of enrollment and graduation rate to have a negative relationship at community colleges. In other words, the current study found the larger the community college's size of enrollment, then the lower that community college's graduation rate. Larger colleges had a significantly lower graduation rate, by about 9% to 13%, than smaller colleges. Bailey, Calcagno, Jenkins, Leinbach, and Kienzl (2006) attributed this in part to a more personalized experience on smaller campuses.

Size of enrollment did not significantly moderate the relations between tuition and graduation rate. This is not to say the findings of Hardy and Katsinas (2007) suggesting separating community colleges by size of enrollment for analysis are not supported by the current study. Although the interaction effect of size of enrollment and tuition did not significantly predict graduation rate, the current study does marginally suggest, at lower levels of enrollment, tuition might predict graduation rate at community colleges to some degree. Hardy and Katsinas (2007) found many small community colleges to be located in rural areas. Low-enrollment, rural community colleges can, often, be identified by students with low-income (Hlinka, Mobelini, & Giltner, 2015). These students can very often face limited employment opportunities and social mobility (Hicks, West, Amos, & Maheshwari, 2014). Occupations that are available in rural areas can be identified as having lower status with lower wages and benefits than those found in suburban and urban areas (Hlinka, Mobelini, & Giltner, 2015). It is possible higher tuition is preventing lower-income, lower-performing students from enrolling in the first place. Implications for this population will be discussed in the next section.

Implications for Practice

This section includes implications for action for persons who might benefit from the current study. Also, this section contains recommendations for practitioners and leaders, and recommendations for future research are also included.

When considering implications for action based on the current study, the mostly modest results limit any extensive justification for implications. While the control variables of percentage of students receiving Pell Grants or other federal grants, percentage of students receiving loans, and percentage of non-dominant group students did significantly predict graduation rate, the design of the current study limits any conclusions towards implications for

action based on these variables. Based on the present study, however, students who receive Pell Grants and non-dominant group students require increased focus to complete their degrees. Students who receive loans at community colleges seem to be at an advantage as has been found at lower amounts of debt (Dwyer, McCloud & Hodson, 2012).

When considering all implications, the present study's results are modest as to how tuition affects graduation rate. This holds true for medium and large sizes of enrollment. There are limited implications, however, for the effect of tuition on graduation rate at small enrollment community colleges.

While the current study ultimately found size of enrollment did not moderate the relations between tuition and graduation rate, the interaction effect was quite close to being significant. Though having modest results, the present study has limited implications for small sizes of enrollment at community colleges. For small sizes of enrollment, higher tuition predicted higher graduation rates. What this potentially means is increasing tuition may be responsible for low-income students in rural areas, who are typically lower performing academically, being prevented from enrolling in the first place possibly leaving higher performing students to enroll and complete a degree thus raising the community college's graduation rate.

Students from rural areas who are often first generation and low-income were found to face lower completion rates after poor preparation for college academics and requiring developmental coursework (Hicks, West, Amos, & Maheshwari, 2014). Action needs to be taken to increase the number of degrees granted at two-year as well as four-year colleges to increase opportunities for low-income students from rural areas. Changing the level of tuition will not help these students complete at higher rates. Student success initiatives are more likely to increase graduation rates and other completion indices than lowering tuition.

Recommendations for practitioners and leaders. Based on the present study, practitioners and leaders should seek additional action other than adjusting tuition to affect graduation rates. If the goal is to increase college graduates, lowering tuition alone will not reach it. Practitioners and leaders should focus on areas such as proper financial aid literacy, support for non-dominant group students, and/or academics such as reconfiguring developmental courses rather than focus on tuition to increase graduation rates. The goal, set by President Obama, of increasing graduation rates by 50 percent (Obama, 2009) is important and deserves strategic thought in how to accomplish it. The future economy needs people with two-year and four-year degrees in order for it to be robust and forward thinking. While the current study found that lowering tuition was not the most effective method for increasing graduation rates, practitioners and leaders should be dutiful in finding the methods that do increase graduation rates.

Potentially, community college leaders and local government officials from rural areas should revisit the level of tuition at their community colleges to determine if it is functioning as a deterrent for low-income students from enrolling in college. Since many community colleges' tuitions are set at the state level, rural area community college leaders should take action in educating people about the effective use of Pell Grants and loans to finance college in order to mitigate the potential negative effects higher tuition on lower-income students (Hicks, West, Amos, & Maheshwari, 2014). If the goal is to increase graduation rates in rural areas, addressing these concerns is one potential method for doing so.

The current study found community colleges with higher percentages of students receiving Pell Grants or other grants, also, had lower graduation rates. Students who receive Pell Grants are by definition low-income and are more at risk for not completing a degree.

Community college leaders should take action to support these students in all ways academic as well as incorporate them into the social fabric of the campus (Tinto, 1993). Students receiving Pell Grants can be made more aware of all the campus resources available to them, social and academic, to increase their sense of community. This can be done by creating mandatory orientations, prior to a student's first semester in college, where tutoring locations and times, academic deans' contact information, locations for social interaction as well as student affairs offices can be made clearly apparent especially to at-risk students who might not otherwise seek out this information. Also, community colleges should reach out to their local high schools and put on informative assemblies, featuring student affairs professionals as well as professors, for all high school students, including for at-risk students, who are interested in going to the community college in order to show how a student can become active on their future campus academically and socially. Such information can also be shared by raising a community college's social media presence.

Low-income students, especially those eligible for Pell Grants, often lack sufficient knowledge of financial aid resources. Menges and Leonhard (2016) found that financial literacy was comparably low for all students and sub-groups. Community college leaders and practitioners must provide literacy about financial aid which is critical for these students to complete a two-year and potentially four-year degree (McKinney, Mukherjee, Wade, Shefman, & Breed, 2015). This can be done by providing coaches for each high school that feeds a community college who can provide guidance in career selection and the admission process but more importantly walk a student and their family through filling out the Free Application for Federal Student Aid (FAFSA) as well as provide information on all financial aid especially the importance of and availability of Pell Grants for low-income families. This program would be

similar to the High School Career Coach program provided by the Virginia Community College System and would help students in many ways including avoiding selection for the verification process. If a college does not have the personnel or funds to provide such a coach, the community college can reach out to the community in attempt to fund such a position with grants.

Recommendations for Future Research

The present study lends several opportunities for future study based in part on the modest results as well as other reasons. First, more significant results could potentially be yielded from changing the level of analysis from institutional to student-level of analysis. While institutional level data were readily available for the current study, student-level data could potentially be more challenging to obtain but could potentially provide more robust results based on a deeper level of analysis than the current study. Student-level analysis would provide opportunities for research questions focused on degree completion and transfer rates rather than graduation rates. Student-level analysis would mostly likely be conducted best on a state-by-state or college-by-college basis. Choosing a few states or a few colleges at a time could make additional variables available that are simply not feasible to consider when conducting an institutional analysis of all public community colleges.

The outcome for the current study was graduation rate which is admittedly not the most ideal dependent variable for measuring the success of a community college. This outcome was the best dependent variable available for institutional level of analysis. With a focus on student-level of analysis, future research could focus on transfer rates, persistence, certificate completions, dual enrollment numbers, workforce development certifications granted, and of

course degree completion. These are potentially better measures of a community college's effectiveness.

While regression analysis was the best research design for the current study, future research could potential include qualitative research, mixed-methods, or regression analysis on Likert scale questionnaires. Again, these types of research designs often constitute student-level analysis and could potentially provide richer results than the current study. The goal of the current study, in part, was to determine community college effectiveness with regards to tuition and some of these different research designs could potentially better provide such insight.

The present study would have benefited from some prior academic achievement measures, for control variables, such as average SAT, average ACT, or average high school GPA of incoming students. These measures are not consistently required at community colleges. Future research, potentially on a student-level of analysis, could provide such prior academic achievement measures. Also, the study of a sample rather than a population could provide such measures. In other words, analyzing one or several community colleges might make these variables more available.

The current study's only potentially significant results came with small sizes of enrollment concerning tuition and graduation rate. While the results of the current study are modest, future research could find more significance by studying community colleges at different sizes of enrollment especially with a focus on tuition and graduation rates at low enrollment schools. The effect of how increasing tuition affects graduation rates at low enrollment schools could be more carefully and extensively examined in future research possibly with a different research design as previously mentioned.

While the current study did not provide results indicating the effect of zero tuition on graduation rate, future research could be conducted that does so when the data were available. This research could be valuable in determining how effective the measure of free tuition is on aiding student graduation as well as how effective community colleges are performing under such circumstances. State community college systems or individual community colleges with free tuition could be the focus of analysis. The present study would seem to indicate that free community college does not increase graduation rate.

Based on the goals for increasing graduation rates, further research needs to be conducted which can determine what practices do increase graduation rates at community colleges. The current study focused on financial effects on graduation rates but certainly other areas affect graduation rates. For example, some indication from the current study revealed that increasing non-dominant group student degree completions would increase overall graduation rates. This is one area suitable for future research concerning increasing graduation rates but certainly other areas affected by practices within student affairs and academic affairs should be researched in regards to how to increase graduation rates.

Concluding Remarks

The purpose of the present study was to examine if tuition predicts graduation rate for the public community colleges in the United States. Findings from the current study added to the literature about tuition and graduation rates using recent data in the context of different sizes of enrollment, college debt and grant aid, and consideration of non-dominant group students for community colleges. Tuition does not significantly predict graduation rate for community colleges as found by the current study. The modest findings of the current study are strictly true

for different sizes of enrollment although future research could better determine how tuition affects graduation rate at community college with small sizes of enrollment.

Free tuition has the potential to provide higher education to those who certainly cannot afford it otherwise. Community colleges have had a mission of open access and low tuition (Shannon & Smith, 2006; Vaughan, 2006) in order to increase degree and certificate completion and thus providing an avenue to a middle-class existence for all. The present study sought to determine if tuition, primarily low tuition, affected graduation rates. While the results were modest, tuition does not seem to affect graduation rate.

There are a couple of potential practices and outcomes which require future research for the creation of policy, however, the current study does not necessarily prevent the basis for such action. Community colleges could lower tuition with limited concern for decreasing graduation rates and could potentially, while considering all factors, increase graduation rates. This possibility would contribute to reaching the goal set by President Obama in his 2009 American Graduation Initiative to increase graduation rates 50%. Also, the current study does not prevent the continued and innovative practice of many states, cities and community colleges offering higher education for no tuition and bringing to fruition the charge laid out by President Obama's 2015 State of the Union Address calling for free community college for all.

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