2017

Are Title V Grants and Educational Expenditures Associated with Educational Attainment of Latinas/os at Hispanic Serving Institutions? = Están las subvenciones del programa federal Title V y gastos en educación (instrucción, apoyo académico, y servicios a las/os estudiantes) relacionados con los logros educativos de las/os Latinas/os en las instituciones de estudios superiores que sirven a las/os Latinas/os (HSI)?

Ligia Perez

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Are Title V Grants and Educational Expenditures Associated with Educational Attainment of
Latinas/os at Hispanic Serving Institutions?

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Dissertation submitted
To the College of Education and Human Services
at West Virginia University

In partial fulfillment of the requirements for the degree of

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2017

Keywords: Hispanic Serving Institutions (HSI), Latina/o college students, Latinas/os graduation outcomes, Title V HSI grants, hierarchical multiple regression analysis.

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Abstract

Are Title V Grants and Educational Expenditures Associated with Educational Attainment of Latina/os at Hispanic Serving Institutions?

Ligia Perez

The purpose of this study is to determine if Title V HSI grants and expenditures in instruction, academic support, and student services at 4-year Hispanic Serving Institutions (HSIs) account for observed differences in the graduation rates of Latinas/os and the percent of bachelor's degree completions of Latina/o students, and whether HSIs are equitable in the proportion of bachelor's degrees awarded to Latinas/os. HSIs are colleges and universities that enroll 25% or more full time equivalent (FTE) undergraduate Latina/o students. In general, the purpose of the federal Title V HSI grant is to fund programs to enhance the educational attainment of Latina/os. This study uses Tinto's (2012) framework for institutional action advancing that colleges and universities that establish support programs designed to promote students' success eventually see those programs translate into improved institutional graduation outcomes. A nationally representative sample of 75 four-year accredited, bachelor's degree granting institutions of higher education with at least 25% undergraduate Latina/o students by 2012 fall was selected from the Integrated Postsecondary Data System (IPEDS) for this study. Consistent with prior research, statistical analyses revealed that expenditures in academic support and student services are significantly associated with graduation rates of Latina/os, however, the expenditures in instruction was not a significant predictor of graduation rates of Latina/os. The role of Title V HSI grants was significant when the variable that accounted for the percentage of undergraduate Latinas/os was removed from the analysis. Title V grantees experienced a greater number of bachelor's degrees completions conferred on Latinas/os when compared to other HSIs in the sample. On average, HSIs were equitable in conferring bachelor's degrees on Latina/os. Future research should investigate expenditures in instructional activities that are directly associated with student learning at HSIs, and the type of Title V grant-funded activities that are greater predictors of Latina/o student success.

Keywords: Hispanic Serving Institutions (HSI), Latina/o college students, Latina/o graduation outcomes, Title V HSI grant, hierarchical multiple regression analysis.

Dedication

I dedicate this work to my children, Yang and Damian, whose college experiences inspired me to investigate Latinos in higher education. Intrigued by their college experiences, I discovered that Latinas/os college-going and educational attainment is a nationwide phenomenon needing attention. As of the date of this study, there are too many Latinas/os, that once in college, decide to leave it for later at best, or forever, missing one of the most incredible experiences afforded to an individual in our culture. Unfortunately, too many institutions of higher education remain unprepared to assist Latinas/os succeed. I dedicate my degree attainment to Gil, my amazing husband, whose unwavering support aided me to complete this long and challenging journey.

Acknowledgment

I want to acknowledge and thank each and every one of my committee members for their support throughout my educational experience at West Virginia University: Samuel Stack, Ph.D., Reagan Curtis, Ph.D., Paul Hernandez, Ph.D., M Cecil Smith, Ph.D., and Nathaniel Sorber, Ph.D.. I want to thank in particular Dr. Samuel Stack, my advisor and doctoral committee chair, who helped me navigate the administrative curves and turns. It is not an easy environment and one needs a resource person to succeed. Dr. Stack made me feel at home and gave me a sense of community in the doctoral journey that sometimes feels more like a virtual monastery. Thanks also to Dr. Hernandez for your assistance with the method section. I appreciate your patience in guiding this investigation with unruly, real life data.

I want to thank West Virginia University, an institution that provided me support through the Office of Graduate Education and Life, so that I could complete my degree. More importantly, I want to express my gratitude to Dr. Constina Charbonnette, who on behalf of the institution believed in me. I am forever thankful for your caring and amazing warmth as a person. All educational institutions should have more people like you.

Thanks are due to many scholar who have investigated Latinas/os in higher education. To all these dedicated researchers I extend my gratitude for helping all of us understand the plight of Latina/o populations and their college-going experiences.

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Chapter 1: Introduction

The participation of Latina/o¹ students in higher education has increased from 22% in 1993 to 35% (2.3 million) in 2014 (Krogstad, 2016), however, their degree attainment remains disproportionately low. In spite of the almost 110% increase from 2002-03 to 2012-13 in bachelor's degrees conferred on Latina/os, only 14% of adult Latina/os age 25 and older have attained at least a bachelor's degree compared to 33% of their White peers (Musu-Gillette, Robinson, McFarland, KewalRamani, Zhang, & Wilkinson-Flicker, 2016). In addition, more than 60% of undergraduate Latina/o students enroll at approximate 13% of higher education institutions, those characterized as Hispanic Serving Institutions [HSI] (Excelencia in Education, n.d.). Accordingly, HSIs are "accredited, degree granting, public or private, nonprofit colleges and universities with 25% or more Hispanic enrollment" (Calderon Galdeano, Flores, & Moder, 2012, p. 158). There has been inconsistent findings about the role of HSIs in advancing the educational attainment of Latina/os. Therefore, this study investigates Title V federal grant and educational expenditures as factors associated with the bachelor's degree attainment of Latinas/os at HSIs.

Even though HSIs were not founded with the mission of serving particular student populations, as Historically Black Colleges and Universities [HBCU] (Laden, 2001) were, HSIs play a critical role in the education of Latinas/os because they enroll and graduate a large proportion of undergraduate Latina/o students. Degree attainment as an outcome of higher education experience is particularly important to students because those who earn a degree financially outperform those with lower levels of education (Baum, Ma, & Payea, 2013; Pew

¹ In this document the words Latina/o and Hispanic are used interchangeably to indicate a population group of persons of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

Research Center, 2012). Degree completions prove an important outcome to HSIs, particularly as an accountability indicator of their role in advancing Latinas/os' education and economic outcomes. Research has found that more Latinas/os complete bachelor's degrees at HSIs than at non-HSIs (Harmon, 2012; Laden, 1998, 2001), however, some scholars question whether HSIs are equitable in their role of advancing Latinas/os' degree attainment (Contreras, Malcolm, & Bensimon, 2008).

Although the HSI term applies to many colleges and universities with a high concentration of undergraduate Latina/o students enrolled (25% or more), the U.S. Department of Education (USDE) officially designates the HSI status only after an institution undergoes an application process. The socioeconomic level of the student body is also considered in the application for HSI official designation. The official HSI designation is important because once a higher education institution acquires the designation, it is eligible to compete for Title V HSI federal grants ("Title V," hereinafter). Most institutions awarded Title V allocate these financial resources to develop and implement programs to promote the academic achievement of Latinas/os, including faculty development to increase the success of all students and the institution's academic quality (Villarreal & Santiago, 2012).

A matter of concern about HSIs has been that they tend to have low student graduation rates (Contreras et al., 2008; Santiago, Taylor, & Calderon Galdeano, 2016). Student graduation rates are a performance indicator of institutional effectiveness that remains a challenge not only for HSIs, but also for most institutions of higher education, particularly with their Latina/o students (Fry, 2002). Graduation rate is a USDE official measurement that tracks the percentage of students in a given cohort awarded a degree within 100% (4 years), 150% (6 years), or 200% (8 years) of normal time to complete a degree by the institution where they first started

(“graduation rate,” n.d.). The retention rates reflect the early departure of a student that started college with a cohort. Therefore, retention rate is an important institutional measure because it is directly associated with the graduation rate of the institution. This measure tracks the percent of full-time, first-time, first-year students from a cohort that re-enroll at the same institution for their second year (“retention rate,” n.d.).

Recent reports about national average-graduation rates of 4-year colleges and universities in the U.S. show a slight rise. For instance, the six-year graduation rates have risen from 57.5% for the cohort starting in 2000 to 59.6% for the cohort starting in 2008 (National Center for Education Statistics [NCES], n.d.). Research has found that the overall graduation rates of HSIs are below the national average (Santiago et al., 2016). To examine the graduation rates of Latinas/os enrolled at HSIs, this study investigates the 6-year graduation rates of Latina/o students who started college as part of the 2007 fall semester cohort and graduated during the 2012-2013 academic year. This examination takes into account the cohort’s fall 2007 to fall 2008 retention rates.

Unlike the graduation rates measurement that refers to a particular student cohort, degree completion refers to the number of degrees awarded by an institution on an annual basis to students who completed all degree requirements, regardless of when and where the students started their higher education careers (“completions,” n.d.). Thus, degree completion captures a broader range of students served by colleges and universities because this measure accounts for students that attend part-time, stop out, or transfer (Tinto, 2012). Research has found unequal degree completion outcomes of Latinas/os in higher education when compared to other racial and ethnic peers (Contreras et al., 2008). This study examines also the percentage of degrees awarded to Latina/o students out of total degree completions in the 2012-2013 academic year at

HSIs, and whether HSIs are equitable in conferring bachelor's degrees to Latina/o students. An institution's degree equity refers to the proportionality of degrees conferred upon Latina/o students, accounting for the proportion of undergraduate Latina/o students enrolled 6 years earlier at the institution.

Student educational attainment at HSIs may be a function of these institutions' financial resources. Research has found an association between low institutional funding and decline in college completion rates (Bound, Lovenheim, & Turner, 2010). When compared to other institutions with similar academic programs, HSIs have been found to be underfunded (20 U.S. Code § 1101a); therefore, most HSIs operate within a constrained financial context (de los Santos & Cuamea, 2010; Flores & Park, 2015; Ortega, Fry, Nellum, Kamimura, & Vidal-Rodriguez, 2015). Consequently, HSIs spend proportionally less than other institutions on instruction, academic support, and student services functions (Merisotis & McCarthy, 2005).

In general, when compared to less selective institutions, selective institutions have great financial resources and higher graduation rates (Gansemer-Topf & Schuh, 2006). HSIs tend to be less selective institutions with high student acceptance rates (Garcia, 2012; Malcom-Piqueux & Lee, 2011). Research has found that less selective institutions experience lower graduation rates (Horn, 2006). Selectivity was also associated with student persistence, which increases their likelihood of degree completion (Titus, 2004). Selectivity criteria refer to academic preparation (i.e., college admission standardized test scores) and the percent of students admitted from the pool of applicants.

Notwithstanding those findings, HSIs allocate resources for instruction, academic support, and student services expenditures to advance their missions and the success of their students. Instruction expenditures are the expenses of colleges, schools, departments, and other

units of colleges and universities on academic instruction such as credit and non-credit course offerings among other instructional activities (“instruction,” n.d.). Academic support expenditures are institutional expenses for activities and services in support of instruction, research, and public service such as libraries, museums, faculty development, course and curriculum development, and in some instances, information technology expenses (“academic support,” n.d.). Student services expenditures are expenses for “activities whose primary purpose is to contribute to students’ emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program” (“student services,” n.d.). Examples of student services expense activities include admissions and registrar services, cultural events, intramural athletics, student organizations, and supplemental instruction services.

According to Fry (2002), the low educational attainment of Latina/o students can be attributed to factors related to their college experience. There is abundant research about factors that influence a student’s decision to stay at or leave his or her higher education institution. For example, the college impact models suggest that the interaction between the student and the college environment plays a role in a student’s educational outcomes (Pascarella & Terenzini, 2005). Astin (1993) asserted that for students to learn they need to be involved with their learning; therefore, colleges should provide academic and social opportunities for students to get involved with their learning experience. Similarly, Tinto (1997) argued that when students have positive experiences in college they integrate into the academic and social systems of the institution, which increases their likelihood of persistence and degree attainment within the institution. Pascarella and Terenzini (2005) also found that the interaction between student

characteristics (i.e., demographics) and the institutional environment (e.g., size, selectivity) contributes to college persistence.

More recently, Tinto (2010, 2012) advanced an alternate framework for institutional action. This framework highlights the importance of programs designed to promote student success (i.e., degree attainment). The framework contends that an institution of higher education has an “obligation to do what it can to help the student stay and graduate” (Tinto, 2012, p. 6). The tenets of the framework are implemented through support programs that communicate high expectations for all students, assist students in meeting those expectations, create opportunities for students to become engaged, and assess students’ learning (Tinto, 2012). To a certain extent, support programs have been instituted throughout colleges and universities. This is evident in the ubiquitous presence of academic and career counseling services, developmental (remedial) services, first-year seminars, and learning communities, among others. Research has found these types of programs improve student retention and graduation rates (Barefoot, 2005; Cambridge-Williams, Winsler, Kitsantas, & Bernard, 2013). Likewise, Latina/o students’ persistence and degree attainment increase when they participate in these types of institutional programs (Berrios-Allison, 2011; Gonzales, Brammer, & Sawilowsky, 2015; Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005; Salas, Aragon, Alandejani, & Timpson, 2014; Santos & Reigadas, 2002; Torres & Hernandez, 2010).

Institutions that allocate resources to intentionally create opportunities for students to connect with faculty, peer students, and the college environment tend to be consistent with models of college impact (Astin, 1993; Pascarella & Terenzini, 2005; Tinto, 1993, 2006, 2012). Research has found that how colleges and universities allocate resources can influence the educational outcomes (e.g., degree attainment) of their students and the effectiveness of the

institutions (e.g., graduation rates). Furthermore, expenditures in instruction, academic support, student services, and institutional support were found to influence graduation rates at 4-year institutions (Gansemer-Topf & Schuh, 2005, 2006; Garcia, 2012; Ryan, 2004). Additionally, institutions with limited resources are more likely to spend less per student (Bound, Lovenheim, & Turner, 2012). This later finding is relevant because levels of per student expenditure are a significant factor associated with students' college completion (Flores & Park, 2013, 2015).

This study builds on current research to examine whether the expenditures in instruction, academic support, and student services at 4-year HSIs are associated with the HSIs' graduation rates of Latina/o students and with the percentage of degrees awarded to Latina/o students out of the total bachelor's degree completions at the HSIs. It also examines whether HSIs are equitable in conferring bachelor's degrees on Latina/o students in proportion to their enrollment. The study takes into consideration whether or not an institution received a Title V HSI grant within the 1999 to 2012 period. Institutional student retention rates also are included as a control variable because when students persist throughout their academic careers, it can result in greater graduation rates and total degree completions. Research on HSIs is relevant for a better understanding of the ever-changing landscape of higher education in the U.S. and, specifically, of how HSIs relate to Latina/o students' academic success.

Early work on the role of educational expenditures in colleges examined institutional and student characteristics (Cabrera, Nora, & Castaneda, 1992). This is important knowledge because it helps in understanding the role of student characteristics in degree attainment. Similarly, institutional characteristics are also important for understanding the environmental factors associated with students' educational outcomes. Having a significant proportion of Latina/o students (25% or more) is therefore a relevant factor to examine in colleges and universities that

acquire such HSI distinction. Research about HSIs and Latina/o students' academic outcomes is expanding because higher education scholars and legislators are interested in this growing sector of the population and its educational outcomes.

Most empirical studies about Latinas/os' degree attainment explore whether the percentages of Latina/o students, staff, and faculty influence graduation rates at 4-year HSIs and non-HSIs (Garcia, 2012); evaluate HSIs at the state level (Contreras & Contreras, 2015); and examine HSIs' role in access to college and the educational attainment of Latinas/os (Laden, 2001; Santiago, 2010, 2012; Santiago & Calderon-Galdeano, 2014). Other research includes educational expenditures and compares 4-year HSIs in the U.S. mainland and Puerto Rico (Nunez & Elizondo, 2012). Further, research also has explored educational outcome equity at HSIs to understand if students attained degrees in proportion to their enrollment by race and ethnicity (Contreras et al., 2008).

There is a gap in the literature in regards to Title V HSI federal grant and educational expenditures association with Latina/o educational outcomes at HSIs. The data collected through the Integrated Postsecondary Data System (IPEDS) national surveys have, since 2002, disaggregated student educational information by ethnicity, enhancing research opportunities to understand educational outcomes of Latinas/os and other underrepresented groups in higher education. Additionally, HSIs and Latina/o students are both moving targets that, within recent decades, have reached substantial numbers, particularly 4-year HSIs in the continental U.S. Further examination of institutional resources in specific educational functions and their association to Latinas/os in higher education is potentially a source of information for leaders at HSIs. Such knowledge can influence the decision-making of academic leaders in support of

Latina/o students' degree completion at HSIs. In addition, such findings could further discussions about federal funding for HSIs and that funding's impact on Latinas/os' educational outcomes.

Therefore, the purpose of this study is to determine if Title V grants and expenditures in instruction, academic support, and student services at 4-year HSIs account for observed differences in their Latina/o students' graduation rates and degree completions, and whether HSIs are equitable in the proportion of bachelor's degrees awarded to Latinas/os. Expenditures are investigated as dollar amount per full-time equivalent (FTE) student in instruction, academic support, and student services. Additionally, expenditures are also examined as the percentage of total expenditures. Total expenditure is the sum of the educational expenditure per FTE in instruction, academic support, and student services. This study uses Tinto's (2012) framework for institutional action. The framework is a college impact model, grounded on empirical research, advancing that colleges and universities establish support programs designed to promote students' success, which eventually translate into institutional retention and graduation rates. The goal of the federal Title V HSI grant is to fund programs to enhance the educational attainment of Latinas/os. Because HSIs have a minimum of 25% undergraduate Latina/o students, the percent of undergraduate Latina/o students enrolled in fall 2007 is included as a control variable to account for ethnicity in the student body. Additionally, the percent of students admitted in the 2007 fall term is included as a control variable proxy for institutional selectivity. Consequently, the general questions guiding this study are:

1. Are Title V HSI grant and dollar amount expenditures per student in instruction, academic support, and student services associated with Latina/o students' graduation rates in the fall 2007 cohort at 4-year HSIs?

2. Are Title V HSI grant and percentage expenditures per student in instruction, academic support, and student services associated with Latina/o students' graduation rates in the fall 2007 cohort at 4-year HSIs?
3. Are Title V HSI grant and dollar amount expenditures per student in instruction, academic support, and student services associated with Latina/o students' degree completions in the academic year 2012-2013 at 4-year HSIs?
4. Are Title V HSI grant and percentage expenditures per student in instruction, academic support, and student services associated with Latina/o students' degree completions in the academic year 2012-2013 at 4-year HSIs?
5. Are HSIs equitable in the proportion of bachelor's degrees awarded to Latinas/os?

Chapter 2: Literature Review

This section examines relevant research literature of the following domains: a) Tinto's (2012) framework for institutional action to promote students' success, b) higher education institutions' educational expenditures and their association with students' educational attainment, and c) Hispanic Serving Institutions (HSI), federal Title V HSI grants, and Latina/o students' graduation outcomes at HSIs.

Framework for Institutional Action

The framework for institutional action asserts that colleges and universities need to establish programs designed to promote student success using evidence-based research (Tinto, 2012). When these programs are central to the students and the institution, such as academic support and student services, they become effective and long lasting in fostering the success of students (Kuh, 2011; Tinto, 2012). Since the 1980s, there has been a resurgence of student success programs (Barefoot, 2004). These types of programs help students learn how to navigate the complex higher-education environment, become familiar with resources, bond with peer students, explore majors, and enhance the skills to improve their academic performance (Pascarella & Terenzini, 2005; Tinto, 2012). These programs have, to a certain extent, aided students in achieving their educational goals (i.e., attaining a degree) and improving college and university retention and graduation rates. Furthermore, support programs have been found critical to students who “lack tacit knowledge about what is required to succeed at the university” (Kuh, 2011, p. 283), such as Latinas/os, who tend to be both first-generation and low-income college students (Contreras, 2005; Rodriguez & Calderon Galdeano, 2015).

According to Tinto (2012), colleges and universities need to communicate to students what is expected of them to succeed. Traditionally, these expectations are articulated through

orientation, advising, and career planning programs that offer students a roadmap to navigate the college experience. For instance, orientation programs are critical in communicating institutional expectations to students because most students new to their institutions are encouraged or required to attend such forums. Additionally, most colleges require that students meet with advisors who guide them in finding a major, explain requirements for attaining a degree, and assist with course selection and schedule processes. Research has found that Latina/o students who interact with advisors throughout their academic careers develop strong institutional commitments and express satisfaction with their faculty (Torres & Hernandez, 2010). Furthermore, Latina/o students who participate in career support groups achieve higher retention rates than Latina/o counterparts who do not (Berrios-Allison, 2011).

The framework for institutional action advances that students need support in order to meet the expectations set by the institution. First-year undergraduate students, in particular, need the greatest support since research shows that freshmen students have the greatest institutional attrition rate (Tinto, 2012). Therefore, institutions ought to implement support programs early in students' academic careers, because students who perceive a supportive institution have been found to be more likely to experience better academic and social outcomes (Reason, Terenzini, & Domingo, 2007). Similarly, nontraditional students (i.e., Latinas/os) who are involved in the social and academic activities of their institutions tend to be more involved in their learning (Rendon, 1994).

Social support programs are important because these influence a student's sense of belonging and membership in the social communities of the institution (Tinto, 2012). For example, Latina/o students who feel validated by their academic community increase their sense of self-esteem, and are more likely to adjust to the institution (Toews & Yazedjian, 2009).

Latinas/os can also develop a sense of belonging when “a resource person assists them in negotiating the university and affirms that they belong” (Musoba, Collazo, & Placide, 2013, p. 361). Furthermore, Latina/o students who participate in mentor programs “learn to network, build positive relationships, better navigate the campus environment, and reach out and mentor other Latina/o students” (Salas et al., 2014, p. 240). However, when Latina/o students have negative perceptions of their college environment, they can experience a decline in their cognitive skills and disengage from the institution (Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005).

Thus, institutional action means that an institution provides a wide range of academic and social support programs aligned to meet the students’ needs. Developmental programs are particularly relevant, as a greater percentage of students who enter higher education tend to be academically underprepared, particularly Latinas/os (de los Santos & Cuamea, 2010; National Assessment of Educational Progress [NAEP], 2015). Research has demonstrated that developmental programs increase students’ success (Adelman, 2006). Summer bridge, first-year seminars, and learning communities are among the most common support programs since the late 1990s designed to promote student success. Close to 70% of undergraduate colleges have been offering a first-year seminar as a mechanism to address student retention (Barefoot, 2004). The importance of these types of programs is that they facilitate the transition and adjustment into the college environment (Barefoot, 2004; Pascarella & Terenzini, 2005).

In general, students who participate in summer bridge programs are introduced to academic support and student services (i.e., libraries, student center, and ethnic centers) and provided with opportunities to meet faculty and staff. Research has found that bridge programs are most effective for Latina/o students when they are designed to promote connections to the

academic environment in the context of a caring community. A caring community welcomes and affirms their ethnic identity and structures opportunities for these students to develop a sense of belonging to the organization early on in their academic careers. These programs have been associated with increased Latina/o student retention and academic success, and with “raising their educational and career aspirations” (Laden, 1998, p. 19).

First-year seminars are credit courses that a student cohort take together, in a supported environment, for academic and social exploration. This academic experience provides a group of students with the opportunity to establish relationships with their peers and with course faculty early in their academic careers. There are a variety of such first-year courses, some designed to promote basic skills (i.e., time management), while others are gateway courses (i.e., math, English).

Learning communities have a more formal academic approach, and for the most part are taught by academic faculty (Tinto, 2012). Learning community programs are effective in increasing the likelihood of persistence in Latina/o students, particularly if the learning community has a culturally reflective curriculum (Gonzales et al., 2015). In general, research has found positive effects from first-year experience courses, orientation courses, and learning communities in promoting students’ persistence and degree attainment (Cambridge-Williams et al., 2013). Similarly, support programs promote Latina/o students’ academic integration, persistence, and satisfaction with their faculty, and increase the students’ cultural affinity and sense of commitment to the institution (Nora, 2002).

The framework for institutional action calls for assessment as a systematic institutional practice to assist students throughout their academic careers. Assessment of students creates environments that empower students, faculty, and staff “to adjust their behaviors to better

promote student success” (Tinto, 2012, p. 54). For example, entry assessment of students’ academic preparation provides information for advisors to use in recommending appropriate courses, including supplemental education (Tinto, 2012). This is particularly important to Latina/o students because close to one third of first-year undergraduate Latina/o students attending public institutions report taking developmental courses (Sparks & Malkus, 2013). Faculty play a critical role in the assessment of students. In some instances, faculty need training to understand, participate, and benefit from assessing learning and teaching (Hutchings, 2010). Additionally, because faculty oversee students’ academic performance, they are key in the use of early alert systems established in many colleges and universities. Early alert systems have become a mechanism to identify students at risk of academic underperformance within the first few weeks of a term. Provided these systems are properly implemented, academic services and student support units work in collaboration with faculty and students to identify the most appropriate support program for a student (Tinto, 2012).

Programs implemented to promote student persistence and degree attainment need ongoing evaluation for improvement and to assess whether they meet desired goals (American Association for Higher Education [AAHE], 1992; Astin, Banta, Cross, El-Khawas, Ewell, Hutchings, & Moran, 1996). Assessment of programs tends to be “concerned for the measurement of student or trainee accomplishment, whatever the outcomes specified in goal statements” (Stake, 2004, p. 35). In other words, the assessment of a support program with the goal of increasing student retention would be to evaluate whether students who participate in the program have higher retention rates than comparable student peers who do not participate in the program (Stake, 2004). Assessment of support programs can highlight areas that need further attention to improve services for students. For example, research has found that Latina/o students

tend to use support services programs more often than other students (Fischer, 2007), while other assessments identified that Latina/o students want detailed career-planning support and advising, as well as timely information about institutional policies for those not familiar with college culture (Musoba et al., 2013). It is imperative that institutions that implement support programs collect and analyze program data. This practice “enables a college to determine where it should focus precious time and resources” (Gonzalez & Ballysingh, 2012, p. 287).

The framework for institutional action insists that institutions ought to provide opportunities for students to become engaged with their environment. Students’ involvement is essential for student retention and increases their likelihood of graduation (Astin, 1993; Tinto, 2012). Research has found that students who are engaged in their educational experience and establish social and academic connections with student peers, faculty, and staff, report higher satisfaction and increased institutional retention (Fischer, 2007). Therefore, Tinto (2012) argued that faculty ought to use student-centered pedagogies that engage students in their own learning and engage them with peers in the classroom. The attendance pattern of Latina/o students (e.g., part-time) makes the classroom experience a critical space and the one most conducive for student engagement (Tinto, 2012). Hence, institutions interested in the adoption of pedagogies that engage students need to invest in curriculum and faculty development (Tinto, 2012). Examples of these pedagogies include problem-based learning, case studies, collaborative learning, and experiential education that is learner-centered in its instruction and curriculum (Savery, 2006). Additionally, curriculum approaches can take into account faculty and student diversity (Nunez, Ramalho, & Cuero, 2010). A culturally relevant pedagogy is inclusive and promotes student academic success by developing and encouraging the student’s cultural

heritage, acknowledging the student's learning styles, and caring about the student as an individual (Brown-Jeffy & Cooper, 2011; Castellanos & Gloria, 2007).

The framework for institutional action utilizes research on support programs and their association with student success. The preceding examples of support programs illustrate the wide variety of programs implemented at institutions of higher education, primarily for first-year students. In general, these programs have a positive influence on student success. The programs tend to be within the academic support and student services administrative infrastructures. However, administrative structures and functions can vary by institution. At the institutional level, these support programs are included within broader categories of educational expenditures (e.g., instruction, academic support, student services) rather than as line items reported to IPEDS. Nonetheless, the impact of these programs on an institution's graduation outcomes is dependent on the level of resources invested to directly influence students (Tinto, 2012; Ryan, 2004).

To be effective, these support programs require investment of resources and intentional actions applied over many years (Carey, 2005). Intentional actions are "reflectively and deliberately employing a set of strategies to produce desired educational outcomes" (Harper, 2011, p. 309). Notwithstanding that, knowledge of effective actions remains uneven and not well organized (Tinto, 2012) and resources devoted to student success programs at colleges and universities have remained minimal to inadequate (College Board, 2009).

Educational Expenditures and Graduation Outcomes

Institution of higher education recipients of Title IV federal financial aid programs report several major educational expenditure categories in the IPEDS annual surveys. These expenditures are for instruction, academic support, student services, institutional support, and research, among others. This study is most interested in the expenditures in instruction, academic

support, and student services and their plausible influence on institutional graduation outcomes because they have been the most examined in the literature. Instruction expenditures include expenses for activities directly related to the instruction of students by colleges, schools, and departments of an institution. Academic support expenditures are institutional expenses on activities and services in support of instruction, of which libraries, faculty development, and course and curriculum development expenses seem most related to the students in this study. Student services expenditures include those related to admissions and registrar services, and activities that “contribute to students’ emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program” (“student services,” n.d.).

While research has found relationships between educational expenditures and students’ educational outcomes, characteristics of institutions and students are also associated with influencing such outcomes. For instance, a study found that students’ socioeconomic status (SES) and institutional expenditure patterns influence students’ college completion (Titus, 2006). Using the Beginning Postsecondary Students (BPS:96/01) survey for student level data and the IPEDS fall 1995 institutional characteristics survey, Titus (2006) found that low SES students have lower completion rates than high SES students, and the greater the level of expenditure per FTE the greater the number of degrees awarded by the institution. Furthermore, the Titus (2006) study indicated that: 1) graduation outcomes were positively related to institutional selectivity (SAT scores), 2) low-income students were underrepresented at selective institutions, and 3) low SES students enrolled in institutions with fewer financial resources to support them to graduation. Moreover, low-SES students were more likely to be African American or Latina/o, and Latinas/os had lower college completion rates than did their White peers (Titus, 2006).

Instruction Expenditure. Several studies have found that expenditures in instruction per FTE are associated with higher graduation rates. Using data from the American Survey of Colleges and the IPEDS surveys, Scott, Bailey, and Kienzl (2006) compared graduation rates at public and private institutions and found that lower graduation rates at public institutions were due to lower resources. Similarly, Gansemer-Topf and Schuh (2004) found that expenditures in instruction and academic support at public and private research and doctoral institutions were significant and positive predictors of graduation rates. Furthermore, Gansemer-Topf and Schuh (2005, 2006) found that in a sample of 4-year private institutions, expenditures in “instruction, academic support, institutional grants and institutional selectivity significantly and positively contributed to graduation rates” (p. 622). This study revealed that both the dollar amount expenditures and the percentage of expenditures in instruction were significant and positive predictors of graduation rates whether an institution was minimally or highly selective. Expenditures in academic support, whether by percentage or by dollar amount, were also significantly associated with graduation rates, with the exception of the percentage expenditures at low selectivity institutions, which were not a significant predictor.

Further, Scott et al. (2006) found that students that enrolled at selective institutions benefited from the higher instructional expenditures at these institutions because higher expenditures in instruction increased students’ likelihood of graduation. Likewise, studies about institutional selectivity found that Latina/o students were more likely to graduate if they attended a more selective institution (Fry, 2004; Gansemer-Topf & Schuh, 2006). However, research has also found that Latina/o students with similar academic preparation were less likely than White students to enroll at selective institutions (Fry, 2004). Fry (2004) stated that selective institutions

“educate only 3 percent of the nation’s undergraduates and even a smaller share of Hispanic undergraduates” (p.10).

According to Ryan (2004), instruction and academic support expenditures produced a significant and positive effect on the graduation rates of the cohort under investigation. This study used a sample of 4-year institutions from the IPEDS survey to examine the graduation rates for the fall 1995 cohort. The data sample also included students’ characteristics (e.g., standardized tests scores, age, gender, race/ethnicity), calculated institutional expenditures per FTE, and stated whether an institution was an HBCU.

Pike, Smart, Kuh, and Hayek (2006) investigated the relationship between resources and student engagement in public and private doctoral, master’s, and liberal arts institutions. Research on student engagement found that students’ engagement in learning increased student educational outcomes (Fischer, 2007; Tinto, 2012). The Pike’s et al. (2006) study included data from IPEDS, the National Survey of Student Engagement (NSSE), and *U.S. News and World Report*. The study found that expenditures in instruction were significantly associated with student engagement because they supported enriching programs that increased student-faculty interaction.

Contrary to most studies, Hayek’s (2001) study revealed that expenditures in instruction were a significant and negative predictor of higher education institutions that used student-centered practices. The study found also that instruction was the highest of the educational expenditures and had the greatest disparity among institutions. This study investigated public and private 4-year institutions and factors (e.g., expenditures per FTE, selectivity) associated with high-performance (student-centered) institutions. “Student-centered” was a construct defined as students’ activities inside and outside the classroom, campus perceptions, and students’

educational gains. Institutions that rated high in these areas were classified as high performance. The study's final model revealed that institutions with high graduation rates were also high performance. Data sources used in the study included the College Student Experience Questionnaire, IPEDS, *U.S. News & World Report*, and *Barron's Profile of American Colleges*.

Garcia (2012) examined Latina/o students' degree attainment and the role of educational expenditures. Garcia's study found that expenditures in instruction and academic support had greater influence on the institutional graduation rates of Latina/o students. The sample in the study compared 4-year HSIs, emerging HSIs (undergraduate Latina/o student enrollment between 15% and 24%), and non-HSIs, using IPEDS. The structural equation model analysis revealed that neither the percentage of Latina/o personnel nor the percentage of Latina/o students enrolled at an institution was a significant predictor of Latina/o students' graduation rates (Garcia, 2012). Only selectivity and institutional resources were significant predictors of graduation rates of Latinas/os.

Academic support expenditures. Ryan's (2004) study found that academic support expenditures have a significant and positive effect on graduation outcomes. Ryan (2004) suggested that both "instructional and academic support expenditures may provide more support for student integration, involvement, engagement, and meaningful experiences that enhance retention" (p. 111). Further, Gansemer-Topf and Schuh (2004) found that higher levels of expenditures in instruction and academic support at institutions resulted in higher retention and graduation rates. The study examined expenditure patterns in instruction and academic support in public and private research and doctoral higher education institutions in the 1999 IPEDS survey and the 2001 *U.S. News & World Report*. Similarly, Hayek's (2001) study revealed that for Latina/o students, there was a positive association with library holdings, a prominent component

of academic support, and institutions that engage students in activities inside and outside the classroom.

Student services expenditures. Unlike research on expenditures in instruction that have been mostly positively associated with graduation rates at 4-year colleges and universities, there have been mixed findings about student services expenditures and their association with institutional graduation outcomes. For example, Ryan (2004) did not find a relationship between student services expenditures and graduation rates, which may have been due to “other activities” in the student services expenses category (p. 110). Ryan (2004) suggested that the student services had staff who were less prepared to assist students, therefore making the services a nonsignificant factor in graduation rates. Similarly, Gansemer-Topf and Schul (2006) reflected that the association between student services expenditures and graduation rates was “an unexpected finding” (p. 633). Their study found that the dollar amount expenditures and the percentage of expenditures in student services were significant and negative predictors of graduation rates at both low and high selective institutions.

Notwithstanding these findings, Oseguera’s (2005) study revealed that expenditures in instruction and student services were significant predictors of 6-year degree attainment for Latina/o students. The study examined 4- and 6-year graduation rates of the fall 1994 freshmen students cohort from 4-year institutions that participated in the Cooperative Institutional Research Program (CIRP) 1994 survey. The study also included the institution’s characteristics (i.e., size, selectivity, financial resources) from the IPEDS surveys. Students in the sample were matched by whether they attended a similar type of institution.

Furthermore, research has found that higher expenditures on student services in higher education have been associated with increased graduation rates for students enrolled at low

selectivity institutions (Webber & Ehrenberg, 2010). Webber and Ehrenberg's (2010) study indicated that increases in student services expenditures had greater impact on the graduation rates than increases in instruction and academic support expenditures at low selectivity institutions. This study used a national sample of 4-year public and private institutions from the Delta Cost Project and included student and institutional characteristics variables (e.g., standardized test scores, average Pell grant amount) to explore whether categories of expenditure per FTE in students services, instruction, academic support, and research were associated with graduation rates. The study's descriptive analysis found that, on average, institutions with low SAT scores and high Pell grant expenditures per FTE experienced lower graduation rates and had lower instructional expenditures compared to institutions with high SAT scores and low Pell grants. According to Webber and Ehrenberg (2010), "higher test score students from higher income families attend institutions with higher instructional expenditures per student than other students do" (p. 949). This study also supported prior research that found that the level of instruction expenditures has a significant and positive impact on graduation rates.

In addition, Webber and Ehrenberg (2010) examined productive inefficiency, using econometric analysis. Productive inefficiency refers to lower graduation rates at some institutions that have the same expenditure levels as other institutions in the sample. The study findings revealed that if institutions were to reallocate resources from instruction to student services, it would increase graduation rates in those institutions with a high percentage of students receiving Pell grants and having lower SAT scores.

Student services expenditures were associated with increased graduation rates for students enrolled at low selectivity institutions with high Pell recipients (Webber & Ehrenberg, 2010). HSIs have been described as less selective institutions with high percentages of Pell

recipients (Nunez & Elizondo, 2012). Therefore, in addition to instruction and academic support, which research has found have significant positive associations with student graduation rates, student services expenditures would be worth exploring to find out whether these expenditures have a significant association with Latina/o graduation rates at HSIs. For instance, Astin (1993) argued that while expenditures in instruction and student services have a positive effect on degree completion, “investment in student services is a more critical environmental factor than the investment in instruction” (p. 331). Moreover, Garcia (2012) found that student services expenditures, in conjunction with other institutional resources, namely instruction, academic support, and institutional support expenditures, contributed to institutional graduation rates of Latina/o students. Ehrenberg and Webber (2010) inferred that the “students who benefit the most from student service expenditures appear to be the ones who are the most disadvantaged academically (in terms of entrance scores) and economically (as is suggested by their eligibility for Pell grants)” (p. 38).

Student enrollment. The number of students enrolled at an institution can determine resources’ availability and their plausible influence on institutional graduation outcomes. Research has found that increased student enrollment has been associated with a decline in resources per student and a longer time to degree, particularly at less selective public universities and colleges (Bound et al., 2012). Bound et al.’s (2012) study examined two cohorts (1972 and 1988) with continuous enrollment from the National Longitudinal Study (NLS72) and the National Educational Longitudinal Study (NELS:88). The study used student to faculty ratio as a proxy for institutional resources and found that over 50% of the 1972 cohort attained a degree within 100% of normal program completion time (4 years), while 39% of the 1988 cohort attained a degree in the same length of time. The study demonstrated that the 1988 cohort

experienced a slower rate of credit accumulation because of the decline in per student resources at public and less selective institutions. Lower resources per student had a negative effect on time to degree completion, over time. However, the study found that at elite public and private institutions, the student-faculty ratio decreased overtime and resulted in increased degree completions.

Research has also found that the number of students enrolled at an institution can influence graduation outcomes. For instance, Morrison (2013) compared the graduation outcomes from public and private institutions, including students' characteristics (i.e., SAT scores, financial aid) and institutional characteristics (size by undergraduate FTE, financial resources, percent minority enrollment) from a 2003-2004 data set of The Education Trust. The study aggregated expenditures (instructional, student services, and academic support) per FTE into a single variable. A logistic regression analysis found that expenditures per FTE and the size of the institution were significant and moderately increased the odds of graduation rates. Similarly, Ryan (2004) found that institutional size had a positive effect on graduation rates. Ryan (2004) indicated that larger institutions "may offer a better variety and higher level of certain academic and support services that enhance student persistence and degree attainment" (p. 110). Ryan's study also found that there was a significant yet negative association between the percentage of minority students enrolled and graduation rates: the larger the percentage of minority students, the lower the graduation rates at the institution.

Assessing educational expenditures and graduation outcomes is a complex issue. Research on expenditures in instruction and academic support found, for the most part, a positive and significant association with institutional graduation rates. However, the research literature examined suggests that the association between student services expenditures and institutional

graduation outcomes is inconclusive. Research has demonstrated that selective institutions have higher instructional expenditures per student than do less selective institutions, and higher expenditures in instruction are associated with higher student graduation outcomes.

Hispanic Serving Institutions

Unlike HBCUs, with their special mission to attend to the educational needs of African Americans, HSIs' mission is not necessarily to serve Latinas/os (Nelson Laird, Bridges, Morelon-Quainoo, Williams, & Holmes, 2007; Laden, 2001). In fact, only three institutions were founded with the purpose of serving Latinas/os—National Hispanic University (NHU), Houston Community College, and Boricua College (Association for the Study of Higher Education [ASHE], 2013), of which one--NHU--ceased operations in 2015 (NHU, n.d.). HSIs “In most cases [are] the result of demographic default rather than conscious design” (Laden, 2001, p. 88). According to Santiago (2012), HSIs are a “political construct to address Latinas/os’ low college-going and educational attainment...[they] enroll in a small number of institutions with limited resources” (p. 163). Furthermore, a predominantly White institution (PWI) of higher education that achieves 25% or more Latina/o student enrollment becomes an HSI (Hurtado & Alvarado, 2015). A matter of concern is that most PWIs have been found unprepared to assist Latina/o students and miss the opportunity to retain and graduate a large portion of their student body (Torres & Zerquera, 2012). PWIs achieve the HSI characteristic depending on the number of Latina/o students enrolled, but they could easily lose it if Latina/o student enrollment decreases, a condition Contreras et al. (2008) called “manufactured identity” (p. 74).

HSIs are a late twentieth-century educational development. Contrary to HBCUs, which are colleges and universities established prior to 1964, HSIs were officially recognized by federal law in 1992 under the Higher Education Act (HEA) of 1965, 20 USCA section 1101a (Laden,

2001). Furthermore, unlike HBCUs, “whose principal mission was, and is, the education of black Americans” (HEA of 1965, in Gasman, 2008, p. 22), which historically have used culturally sensitive programs (Baez, Gasman, & Turner, 2008), HSIs have been the result of enrollment evolution rather than a “sustained commitment to Hispanic students and culture” (Nelson Laird et al., 2007, p. 42). However, HSIs were encouraged to increase the educational attainment of Latinas/os by the creation of the federal Title V HSI grants. The Title V HSI Program provides funding for HSIs to be intentional in serving Latina/o students. HSIs could be strategic and use Title V funds to develop a “sense of collective responsibility and accountability among institutional leaders and faculty members for producing equitable educational outcomes for Latina/o/a students” (Contreras et al., 2008, p. 87).

Title V HSI grant. A Congressional report identified that HSIs received lower FTE funding from state and local sources (20 U.S. Code § 1101a). Therefore, Congress authorized the Developing Hispanic-Serving Institutions Program and its Title V grant as a mechanism to appropriate funds for HSIs (Malcom, Bensimon, & Davila, 2010). Since its inception, the purpose of the Title V HSI program has been to “assist HSIs to expand the educational opportunities for, and improve the educational attainment of, Hispanic students” (USDE, n.d.).

There are three basic requirements that colleges and universities must meet for the USDE to officially designate an accredited institution as an HSI (USDE, n.d.). First, it must meet the 25% undergraduate FTE enrollment. Second, at least 50% of the enrolled students must be recipients of need-based financial support. Lastly, the institution must have lower FTE average educational and general expenditures in comparison with institutions that offer similar instruction (20 U.S. Code § 1101a). The HSI designation means that an institution can compete for a 5-year

grant to implement programs designed to influence Latina/o students' success (i.e., retention, graduation).

The Title V HSI program's priority has been the development of support programs (e.g., tutoring, counseling, student services, developmental and English language courses), faculty development, and curriculum changes to improve Latina/o students' academic success (USDE, n.d.; Villarreal & Santiago, 2012). In addition, since 2008, these activities have focused on support for low-income students (Villarreal & Santiago, 2012). Consequently, the great majority of HSI recipients of Title V grants have created or enhanced programs directed to faculty development, curriculum reform, and student support services (Santiago et al., 2016).

Colleges and universities that apply for Title V grants are required to submit a project detailing goals, expected outcomes, data collection, and project assessment processes to demonstrate enhanced student educational outcomes. Title V grantees also are mandated to submit annual and final evidence-based accountability reports to demonstrate accomplishments. In general, grantees' reports have revealed that programs implemented using Title V funds increased retention and graduation outcomes of Latina/o students (Santiago et al., 2016; Danforth, 2015; Haring-Hendon, 2015).

Title V HSI grants have continued to increase, and as of 2015, HSIs have been awarded over \$100 million (USDE, n.d.). Nonetheless, unlike funding for HBCUs that Congress commits annually by federal appropriation through Title III entitlements, Title V HSI Program grants are awarded on a competitive basis; hence, about half of the ever-growing number of HSIs receive Title V resources (Ortega et al., 2015).

Characteristics of HSIs. According to Excelencia in Education (n.d.), HSIs are heterogeneous, have different missions, and have students with different characteristics. Close to

70% of HSIs are public colleges and universities. Half of HSIs are 4-year or above, and most are located in urban areas with a high concentration of Latina/o populations. With an average enrollment of over 50% of other racial/ethnic groups, HSIs have the most diverse student bodies in higher education.

On average, HSIs enroll a greater percentage of students with financial need and have larger student-to-faculty ratios (Rodriguez & Calderon Galdeano, 2015). Latinas/os who enroll at HSIs are more likely to be the first in their families to attend college, be first- or second-generation immigrants, attend college part-time, work off-campus, and be academically underprepared for college (ASHE, 2013; Cuellar, 2014, 2015; de los Santos & Cuamea, 2010). In general, at HSIs, the academic attainment of Latina/o students is not predicted by standardized test scores (Musoba & Krichevskiy, 2014; Vaquera & Maestas, 2009). In a result similar to that of students at non-HSIs, research has indicated that at HSIs the positive interaction between Latina/o students and faculty increases their academic performance (DeFreitas & Bravo, 2012). HSIs enroll Latina/o students who live geographically near the campus (Laden, 2001) and who are encouraged to enroll by family members, peers, high school teachers, and community college faculty (Cejda, Caspari, & Rhodes, 2002; Cuellar, 2015).

HSIs are located throughout the U.S., particularly in Puerto Rico, which has a large proportion of all HSIs. However, HSIs tend to be located in the “periphery of the United States” (Laden, 2001, p. 77), where Latina/o populations are concentrated. Consequently, most 4-year HSIs in the U.S. mainland are located in the west and central regions of the country (Nunez & Elizondo, 2012). HSIs in Puerto Rico are very different from those in the continental U.S. because instruction takes place in Spanish. Also, HSIs in Puerto Rico were created to meet the

educational needs of local students, and in a region where students, faculty, and administrators are mostly Latinas/os (Malcom et al., 2010).

As stated earlier, HSIs tend to have low financial resources. On an annual basis, HSIs receive cents on the dollar per student from federal sources in comparison to other higher education institutions (Calderon Galdeano et al., 2012; Hispanic Association of Colleges and Universities [HACU], n.d.). In addition, HSIs' ability to increase revenues from tuition and fees is limited because they serve mostly low-income students. This means that most public Hispanic-serving colleges and universities are more dependent on appropriations from state and local sources (Ortega et al., 2015).

Graduation outcomes and degree equity at HSIs. The number of Latinas/os awarded postsecondary degrees has steadily increased over the last two decades, from 12% in 1995 to 23% in 2014 (Santiago et al., 2016). In particular, the number of Latinas/os who earned bachelor's degrees experienced a 63% increase from 2004 to 2013 (Excelencia in Education, n.d.; Santiago, Galdeano, & Taylor, 2015). HSIs contributed to this achievement since they award bachelor's degrees to a greater percentage of Latinas/os (HACU, 2013; Wilds, in Landen, 2001). However, HSIs' 150% of normal program completion time is below that of non-HSIs (Rodriguez & Calderon Galdeano, 2015).

An academic factor associated with HSIs' low graduation rates is the disproportionate number of students who enroll at HSIs who are academically underprepared for college work (de los Santos & Cuamea, 2010), particularly Latinas/os, who generally attend under-resourced public high schools with limited access to rigorous college preparation curricula (Arbona & Nora, 2007; Contreras, 2005; Fry, 2004). Furthermore, HSIs' low graduation rates may be associated with the fact that a significant percentage of the student body tend to be low-income

(Nunez & Elizondo, 2012). Most Latina/o students who enroll at HSIs come from economically disadvantaged backgrounds (Cuellar, 2015; Maestas, Vaquera, & Zehr, 2007; Santos & Saenz, 2014). Research has found that the socioeconomic status of students contributes to graduation outcomes. There is evidence of a wide graduation gap between low-income and high-income students: a large proportion (80%) of students from high-income families attain a bachelor's degree while half or less (40%) of low-income students do (Heller, 2013; Tinto, 2012; Titus, 2006).

HSIs' overall graduation rates (40%) are below the national average (56%, Santiago et al., 2016). Lower graduation rates at HSIs do not account for factors that influence the outcome, such as students' and institutions' characteristics; a different reference point is needed to assess this key performance. For example, HSIs might have graduation outcomes comparable to those of non-HSIs. Research has found that after matching comparable students and controlling for institutional characteristics, graduation outcomes are similar or higher at HSIs compared to non-HSIs (Flores & Park, 2015; Rodriguez & Calderon Galdeano, 2015).

An important factor of low graduation rates at HSIs is the students' attendance pattern. Latina/o students who enroll at HSIs tend to attend college on a part-time basis because they work, and are the first in the family to attend college (Nunez, Sparks, & Hernandez, 2011). Research has found that colleges that enroll "students who are working or have family or financial responsibilities that compete with college are likely to have lower graduation rates" (Scott et al, 2006, p. 250). Because of these type of barriers, Latina/o students' time-to-degree tends to be longer (Scott et al., 2006; Bound et al., 2012; Contreras & Contreras, 2015).

Furthermore, a study that examined HSIs in the U.S. and Puerto Rico found that 4-year HSIs with a "higher proportion of Hispanic students and higher proportions of students receiving

Pell grants were each significantly and negatively associated with graduation rates” (Nunez & Elizondo, 2012, p. 18). Similarly, research on 4-year higher education institutions located in Texas found that selective institutions with high educational expenditures experienced Latina/o graduation rates at a national average, but less selective and less resourced institutions did not attain similar Latina/o graduation outcomes (Vega & Martinez, 2012).

Other studies examined HSIs’ role in degree attainment of Latina/o students and asked whether these institutions were equitable in conferring degrees. The research focused on the proportion of Latina/o students enrolled at HSIs and used the Equity Index to evaluate a fall 2004 cohort from 2- and 4-year HSIs in five states (Bensimon, 2004; Contreras et al., 2008). The research revealed that 4-year HSIs were not equitable in the proportion of degrees awarded to Latina/o students, particularly when compared to White students (Contreras et al., 2008). The formula used to calculate equity used percentage of degrees awarded to Latinas/os divided by the percentage of Latina/o undergraduate enrollment to assess proportionality at a point in time (Contreras et al., 2008). However, the study also found that HSIs were equitable in providing Latinas/os with access to higher education.

Further, Garcia (2012) found that the percentage of Latina/o students enrolled at HSIs, emerging HSIs, and non-HSIs did not predict graduation rates of Latinas/os (p. 265). Contrary to Garcia’s finding, Oseguera’s (2005) study found that large proportions of students “who are of similar background” (p. 48) positively influenced degree attainment among underrepresented groups (i.e., Latinas/os) at 4-year non-HSIs. The study used a 1994 sample from CIRP.

Summary

This chapter provided an overview of three main components that plausibly influence the institutional graduation rates and degree completions of Latina/o students. First, Tinto’s (2012)

framework for institutional action was described. The framework advanced that institutions of higher education ought to communicate high expectations to students, provide support for students to meet expectations, and assess students through the implementation of programs designed to enhance students' success. Research indicated that these types of support programs also positively influenced Latina/o students' academic outcomes at HSIs and non-HSIs.

Second, the implementation of support programs requires funding. Therefore, the framework for institutional action was followed by an overview of the research literature on educational expenditures, particularly expenditures in instruction, academic support, and student services, and their association with institutional graduation measures. Student enrollment was also addressed because, for the most part, research on educational expenditures at colleges and universities has been investigated in terms of FTE.

The last section of the literature review was an overview of HSIs. This section included a description of the federal Title V grant program as a funding source for implementing support programs consistent with Tinto's (2012) framework. Although Title V grant funding is a small percentage of an HSI's budget, it gives institutions funds to target institutional initiatives that promote Latina/o students' success (Santiago et al., 2016). Lastly, empirical research on graduation outcomes of Latina/o students suggested that HSIs play a critical role in the education of Latinas/os because a greater percentage attain bachelor's degrees from these institutions than from non-HSIs.

Purpose of Study

The purpose of this study is to examine Title V HSI grant and expenditures per FTE in instruction, academic support, and student services at 4-year HSIs, and their association with Latinas/os' graduation rates and bachelor's degree completions. Previous studies have examined

relationships between graduation rates and degrees awarded by types of institutions and their educational expenditures. This study furthers these studies by examining Latina/o students at 4-year HSIs in the U.S. only, and with Title V HSI grants, as new variables. In addition, retention rates, percent of undergraduate Latina/o students enrolled, and percent of students admitted variables are included for control. See Figure 1 for details.

Chapter 3: Method

Sample

A national sample of (N=76) 4-year HSIs was selected from the Integrated Postsecondary Data System (IPEDS) for this study. Independently of an official USDE designation, all the institutions selected were considered HSIs because they had 25% or more undergraduate Latina/o students enrolled in fall 2012. The institution was the unit of analysis.

Institutional characteristics. The HSIs selected for this study were located in ten states in the continental U.S., with larger representation from California (37%) and Texas (29%). The institutional sizes, as per IPEDS size categories, included a greater percent (38.7%) of institutions with student enrollment between 1,000 and 4,999, followed by 21.3% with 10,000 to 19,999 enrollment, 20% of institutions with 20,000 and above enrollment, and 18.7% with 5,000 to 9,999 enrollment. The majority of HSIs in the sample received Title V HSI grants (62.7%) at any time during the period from 1999 to 2012. All the institutions in the sample participated in the Title IV federal financial aid program and were accredited. Similar to Latina/o students' 4-year enrollment behavior, the sample had more public (60%) than private not-for-profit (40%) institutions of higher education (NCES, n.d.). The HSIs in the sample were classified as research (13.3%), doctoral (6.7%), master's (77.4%), and baccalaureate (2.7%) institutions by the Carnegie Classification (2010). See Appendix A for the list of institutions.

Data Source

The IPEDS consists of several surveys performed on an annual basis to collect information from postsecondary institutions that participate in federal student aid programs (Title IV). The data sample was selected from the following IPEDS surveys: institutional characteristics, admissions and test scores, fall enrollment, completions, and graduation rates.

Also, the Delta Cost Project (DCP) was used to extract institutions' financial data for this study. The DCP contains financial data "translated [harmonized and standardized] into analytical formats to allow for long-term analyses of trends in postsecondary education" (American Institutes of Research [AIR], n.d.). Instruction expenditures, academic support expenditures, and student services expenditures were the variables used in this study from academic year 2007-2008 through 2012-2013. The institutional identification numbers assigned by the IPEDS system were used to match institutions from the IPEDS and the DCP data files. These datasets (IPEDS and DCP) were merged for analysis. Additionally, data were selected from the Developing Hispanic-Serving Institutions Program (DHSI) Part A– Title V, U.S. Department of Education's website. The data from this website identified HSIs that received Title V grants at any time during the 1999-2012 period.

Sample size, power, and precision

The Free Statistics Calculators 4.0 software website (Soper, 2016) were used to perform power analyses. For a hierarchical multiple regression analysis with seven variables, the Free Statistics Calculator estimated a minimum of 72 cases for detecting a medium-effect size .13 (Cohen, 1992) with power of 0.8, and a .05 probability level. The selection of the .8 Cohen's (1992) power convention was "for an 80% chance of detecting an effect if one genuinely exists" (Field, 2013, p. 69).

Variables

Graduation rates-Latina/o. This is a dependent/outcome variable. It consists of the percent of students in a cohort of full-time, degree-seeking students that completed a program of study and earned a bachelor's degree. For this study, the 2007 fall first-year full-time cohort of students who enrolled at HSIs was selected, therefore the 6-year graduation rates correspond to

the percentage of students from the fall 2007 cohort that graduated in the academic year 2012-2013. Bachelor's degrees were completed and awarded between July 1, 2012 and June 30, 2013.

Percent of bachelor's degrees awarded to Latina/o students. This is a dependent variable. It is a calculated variable used to obtain the percentage of bachelor's degrees awarded to Latina/o students from the HSIs last attended. For this purpose, the number of Hispanic or Latina/o students who completed a bachelor's degree (and the institution that awarded it) between July 1, 2012 and June 30, 2013 was divided by the total number of bachelor's degree completions awarded between July 1, 2012 and June 30, 2013 at that HSI.

In order to account for institutional size, all expenditures were divided by FTE enrollment (Pike et al., 2006). The expenditure variables were calculated by averaging expenditures per FTE for a six-year period from academic year 2007-08 to 2012-13. The six-year period represents the 150% time taken to complete a bachelor's degree program. Also, total educational expenditures is the sum of the dollar amount expenditures per FTE on instruction, academic support, and student services during the six-year period from the academic year 2007-2008 to 2012-2013.

Instruction expenditures per FTE. This variable includes general academic instructional expenses that take place at colleges, schools, departments, and other instructional divisions of colleges and universities. Additionally, the category includes expenses for departmental research and public service that are not separately budgeted; occupational and vocational instruction; community education; preparatory and adult basic education; and regular, special, and extension sessions; and expenses for both credit and non-credit activities.

Information-technology resource expenses related to instructional activities might be included if the institution does not allocate them to other budget areas (i.e., academic support). Institutions include actual or allocated costs for operation and maintenance of plant, interest expense, and

depreciation (“instruction expenditures,” n.d.). This measure is continuous and numeric, and accounts for the six-year average dollar amount expenditures per FTE in instruction by an institution.

Percent of expenditures in instruction per FTE. This variable represents the percentage of total educational expenditures per FTE allocated to instruction at an institution.

Academic support expenditures per FTE. This variable accounts for institutional expenditures on activities and services in support of instruction, research, and public service such as libraries, museums, faculty development, course and curriculum development, and in some instances, information technology expenses among others (“academic expenditures,” n.d.). This measure is continuous, numeric, and accounts for the six-year average dollar amount expenditures per FTE in academic support by an institution.

Percent of expenditures in academic support per FTE. This variable represents the percentage of total educational expenditures allocated to academic support at an institution.

Student services expenditures per FTE. Student services expenditures include “expenses for admissions, registrar activities, and activities whose primary purpose is to contribute to students’ emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program” (“student services,” n.d.). This measure is continuous, numeric, and accounts for the six-year average dollar amount expenditures per FTE in student services by an institution.

Percent of expenditures in student services per FTE. This variable represents the percentage of total educational expenditures allocated to student services at an institution.

Retention rates. This variable refers to year-one to year-two retention. It is the percent of students from the 2007 fall semester cohort (first-time, full-time) who re-enrolled at their

institutions as either full-time or part-time for the following 2008 fall semester. Retention rate has a direct influence on the graduation rates of an institution. This is a control variable.

Grantee. This variable accounts for HSIs that received Title V HSI grants. This category means that an HSI had developed and implemented initiatives and support programs designed to enhance Latina/o students' academic outcomes (i.e., degree attainment). This is a dichotomous categorical variable, where 1 means the institution received Title V funds at any time between 1999 and 2012, while 0 means it did not receive Title V funds during the same period.

Fall 2007 percent of students admitted. IPEDS calculates this field as the total number of admissions divided by the total number of applicants. It is a control variable in this study. It was used as selectivity proxy rather than standardized test scores because, for the most part, HSIs tend to be less selective institutions, and this type of institution does not always require standardized test scores for admission decisions (Garcia, 2012; Malcom-Piqueux & Lee, 2011).

Fall 2007 percent of undergraduate Latina/o students. This variable contains the proportion of undergraduate Latina/o students enrolled at HSIs in fall 2007. It is a control variable.

See Table 1 for variables, variable labels, and sources.

Research Design

This study is nonexperimental, ex post facto, quantitative research. Ex post facto research examines the relationships between the variables of interest after these have already taken place (Ary, Jacobs, Razaviev, & Sorensen, 2010). In an ex post facto research project, the researcher does not manipulate independent variables or randomly assign subjects to different conditions (Ary et al., 2010).

Procedure

IRB and data acquisition. A nonhuman subject research (NHSR) Institutional Review Board protocol was completed at West Virginia University. This research did not involve human subjects. The study used public secondary data available from the IPEDS, Delta Cost Project, and the Department of Education. The data sets examined did not contain individually identifiable private information. (Appendix B).

Chapter 4: Results

Data Analysis

Statistical analyses were performed using IBM SPSS 24. The data set was examined for missing values. Three institutions did not report graduation rates because they did not enroll first-time, full-time students in the 2007 fall semester and were excluded from the graduation rates analysis using a listwise approach. A listwise approach excludes cases with a missing value from any variable from the main analysis.

Descriptive statistics. The HSIs in the sample had a 41.47% Latina/o student graduation rate for the 2007 cohort and 37.32% of total bachelor's degree completions in the academic year 2012-2013 were awarded to Latina/o students. These institutions had average dollar amount expenditures per FTE of \$7063 in instruction, \$1858 in academic support, and \$2049 in student services. These HSIs allocated 64.83% of total educational expenditures per FTE to instruction, 17.04% to academic support, and 18.13% to student services. In fall 2007, the HSIs had a 72.12% admissions rate and the 2007 cohort had a 69.49% retention rate in fall 2008. This study only evaluated retention rates from first to second year of the fall 2007 cohort. In fall 2007, the HSIs in the sample had an average of 35.53% undergraduate Latina/o student enrollment. (See Table 2.)

Overall, HSIs that received Title V grants (grantees) had lower graduation rates and lower retention rates than HSIs that did not receive such funds (non-grantees). In addition, grantee HSIs had lower mean dollar amount expenditures per FTE in instruction and student services than did non-grantee HSIs. Dollar amount expenditures per FTE in student services were about the same in both grantees and non-grantees. Regarding the percentage of total educational expenditures, grantee HSIs allocated a greater percentage of expenditures per FTE in instruction

and academic support than did non-grantee HSIs, and non-grantees allocated a greater percentage of expenditures per FTE in student services than did grantee HSIs. Grantee HSIs had a greater percent of undergraduate Latina/o students in fall 2007 and awarded a greater percent of bachelor's degrees to Latinas/os than did non-grantee HSIs. Both grantee and non-grantee HSIs had similar percentages of admitted students in the 2007 fall term. (See Table 3.)

Pearson correlations for graduation rates of Latina/o students outcome variable (GRLatino) were significantly, positively, and moderately associated with dollar amount of expenditures per FTE in instruction, academic support, and student services predictors ($r = .34$, $p < .01$, $r = .46$, $r = .47$, all $p < .001$, respectively). The relationships between the GRLatino and the percentage of expenditures per FTE was significant and negatively correlated with instruction ($r = -.37$, $p < .001$), and was small, significant, and positively correlated with student services ($r = .29$, $p < .01$). The highest correlation magnitude was between GRLatino and retention ($r = .78$, $p < .001$). Correlations between predictors were all small to moderate with effect sizes between $|.2|$ to $|.45|$, which indicated that there was no presence of multicollinearity threat, with the exception of the correlation between instruction_pct and studserv_pct. These two predictors had a substantial correlation ($r = -.72$). See Tables 4 and 5 for graduation rates outcome variable detailed correlations.

Additionally, Pearson correlations between the percentage of bachelor's degrees awarded to Latinos' (pctBALatino) outcome variable had a close to perfect, large, significant and positive relationship with the undergraduate Latino students enrolled in fall 2007 ($r = .98$, $p < .001$). The outcome variable was also significantly correlated with grantee ($r = .39$), dollar amount expenditures per FTE in student services ($r = -.21$), percent of expenditures per FTE in student services ($r = -.22$), and academic support ($r = .19$). There was a large, significant, and negative

correlation between two predictors, instruction_pct and studserv_pct ($r = -.71$). See Tables 6 and 7 for correlation details. When the pctBALatino outcome variable was log transformed, the correlations between this outcome variable and studserv ($r = -.23$, $p < .05$), studserv_pct ($r = .26$, $p < .05$), acadsupp_pct ($r = .20$, $p < .05$), and grantee ($r = .47$, $p < .001$) were significant. See Tables 8 and 9 for correlation details.

Auxiliary regression analyses for each dependent variable were performed to address the large correlation between two predictors (instruction_pct and studserv_pct) because of multicollinearity concerns. When predictors are highly correlated, they might be measuring the same phenomenon rendering one variable redundant. In addition, when “the sum of the predictors must equal a constant value”, such as in this case where the total was 100% of expenditures; the model could be respecified by dropping one of the independent variables (Cohen et al., 2003, p. 420). For each outcome variable, in one regression analysis the percentage of expenditures in student services predictor (studserv_pct) was removed to investigate its influence on the model, followed by subsequent regression analysis for each outcome variable without the percentage of expenditures in instruction predictor. See Tables 10 to 15 for detailed results by outcome variable.

The negative correlation between the predictors suggested that the instruction_pct predictor exerted a suppression effect. According to Cohen et al., (2003) “suppression is present when either r_{y1} or r_{y2} is less than the product of the other with r_{12} (p. 77). The correlation between instruction_pct (X_1) and GRLatino (Y), $r = -.37$, was less than the product between the correlation between studserv_pct (X_2) and GRLatino (Y), $r = .29$, and the correlation between studserv_pct and instruction_pct, $r_{12} = -.72$, resulted in a value $(-.21)$ higher than instruction_pct

and GRLatino. Consequently, the `instruction_pct` predictor was removed from the hierarchical multiple regression analyses.

In addition, this study used Webber and Ehrenberg's (2010) empirical study as a guide for highly correlated variable selection. Webber and Ehrenberg's (2010) study found that student services expenditures had greater impact on graduation rates at low selectivity institutions with high proportion of low-income students, characteristics similar as those of HSIs, therefore, retained the student services expenditures predictor variable (`studserv_pct`) and removed percentage of expenditures in instruction (`instruction_pct`) to address presence of multicollinearity. Further analyses where expenditures were investigated as percentage of expenditures did not include percentage of expenditures in instruction.

Regression diagnostic procedures. Regression analysis was performed for each dependent variable with predictors to investigate whether any possible outliers were present that could pose undue influence on the model. One case (Carlos Albizu University) was removed due to large standard residual (4.8), standardized DfBeta (-3), and Cook's distance (1.15) beyond cut-off standard values, for a final sample size of 75 cases. General rules for standardized residuals from normal distribution indicate that values higher than $|3|$ are cause for concern because high values are not common in a sample with a normal distribution (Field, 2013). Standardized DFBeta cut-off value of $|1|$ was used to assess whether cases had a large influence on the parameters of the regression model, while Cook's distance with values greater than 1 assessed for cases that could have influence over the model (Field, 2013). There were three cases with standardized residuals higher than ± 2 . These cases were not a cause for concern, however, because for a sample of 75 cases there could be up to 4 cases (5% of sample) with standard residuals larger than $|2|$. The Mahalanobis distance statistics showed some cases with values

greater than 14, the calculated chi-square critical value for 7 variables, $p < .05$. Mahalanobis distance was used to identify whether cases that were too far from the mean of the outcome variable were present. The standardized DFBeta statistics, which indicated if a case had a large influence on the regression parameters, showed that all values were below or close to cut off values (± 1).

The covariance ratio was inspected because this measure assesses whether a case has undue influence in the variance of the regression parameters. Two equations were used to assess for cases whose covariance values could exert some influence: $1 + [3(k + 1)/n]$ and $1 - [3(k + 1)/n]$, where k indicated the number of predictors and n was the number of cases (Field, 2013). There were few cases with covariate ratio values beyond but fairly close to the cut-off values. Additionally, the leverage was calculated as per equation $k+1/n$. Cases with leverage greater than two or three times the equation results could be cause for concern because leverage assesses whether an observed value of the outcome variable has an undue influence over a predicted value. There were few cases with leverage values beyond the average leverage value. Notwithstanding these findings, all cases had Cook's distance below the cut-off standard value (1), meaning that none of the cases had a large effect on the regression analysis and there was no statistical reason to remove any other case from analysis (Field, 2013).

Assumptions. The data set also was examined to ensure it met the assumptions of multiple regression: normality, homoscedasticity, and linearity (Harlow, 2014). The linearity assumption was visually inspected for each dependent variable. Histograms of standardized residuals, normal probability plots, and normal scatter plots between predicted scores and residuals were examined. The histogram of the standardized residuals was symmetrical and approximated a bell shape; this indicated that the residuals were close to a normal distribution for

the graduation rates of Latinas/os outcome variable. Yet, the histogram for the percent of bachelor's degrees awarded to Latinas/os outcome variable was slightly positively skewed, meaning that there were more scores on the lower side of the distribution. The probability-probability (P-P) plots revealed some dots deviation, but most dots were closely aligned to the diagonal line indicative of normally distributed residuals for both outcome variables. Inspection of the scatter plot of standardized residuals against standardized predicted values was used to assess the homoscedasticity assumption. The cloud of dots was distributed around zero (mean) with very few dots outside the cloud. Although this indicated that there was presence of mild heteroscedasticity, regression technique is robust to moderate departure from assumptions (Cohen, Cohen, West, & Aiken, 2003, p. 41). (See Appendix C.)

Additionally, tolerance tests were performed to assess for multicollinearity. Multicollinearity is present when predictors are highly correlated. Presence of multicollinearity can decrease the size of R^2 , regression coefficients might be inaccurate, and predictors with high correlation might be measuring the same phenomenon (Field, 2013). The correlation between two predictors, namely, `instruction_pct` and `studserv_pct` had a large significant correlation ($r = -.72$). All other predictors had small to moderate correlations. Additional collinearity diagnostic tests showed values within cut-off values for the variance inflation factor (VIF) with values well below 10, and the tolerance statistics values were all above 0.2 (Field, 2013). These values suggested absence of multicollinearity.

One control variable (`F07pctULatina/o`) was removed from subsequent analysis to explore predictors of interest (grantee and `studserv`) and their association with the `pctBALatina/o` outcome variable. Diagnostic statistics (i.e., standardized residual, Mahalanobis distance, Cook's distance, etc.) of residuals in the data set were examined and there was no presence of cases that

could exert undue influences on the model. Assumptions were visually inspected (i.e., histogram, scatterplots, and P-P plots) and heteroscedasticity and non-normality of regression residuals were found to be present. The dependent variable (pctBALatina/o) was transformed. Natural logarithm base e (ln) was used to correct for positive skewness, positive kurtosis, heteroscedasticity (unequal variances), and non-linearity (Field, 2013). Additional regression analyses were conducted to investigate multicollinearity between highly correlated predictors.

Examination of the hierarchical multiple regression analyses after the outcome variable was transformed revealed that assumptions were met. Examination of the regression standardized residual's histogram showed improved linear distribution of residuals. The P-P plot showed normality, with dots aligned closely to the diagonal line. Additionally, the scatterplot of standardized residuals against the standardized predicted values showed dots scattered around the zero (mean) line. (See Appendix C.)

Main analysis. Research questions were investigated using hierarchical multiple regression to examine the relationships between predictors and their accuracy in predicting the outcome variables. Hierarchical multiple regression (HMR) was used because predictors are selected according to prior research and entered into the model in an order of importance in predicting the outcome (Field, 2013). Like multiple regression, HMR is a statistical approach used when a research question “involves predicting a single outcome from a set of relevant predictors” (Harlow, 2014, p. 50). Variables in HMR tend to be continuous, but categorical variables can also be included (Field, 2013).

Hierarchical multiple regression analyses were performed on a national sample of 75 HSIs. Factors that contribute to student success were presented as expenditures per FTE in instruction, academic support, and student services (Gansemer-Topf & Schuh, 2004, 2006;

Garcia, 2012; Nunez & Elizondo, 2012; Ryan, 2004; Pike et al., 2006; Titus, 2006; Webber & Ehrenberg, 2010). In addition, the Title V HSI grant was investigated as a predictor of interest. Within the framework used in this study, this predictor was relevant because the purpose of the federal Title V HSI grant is to fund programs to enhance the educational attainment of Latinas/os in institutions of higher education. Additionally, the first-to-second-year retention rates for fall 2007 cohort (retention), the percentage of undergraduate Latinas/os in fall 2007 (F07pctULatina/o), and the percentage of students admitted in the fall 2007 term (F07pctAdmit) were included as control variables. As three institutions did not enroll first-time, full-time students in fall 2007, they did not report graduation rates and were excluded from the analysis of graduation rates.

Model. With the exception of the last research question on degree equity, HMR models were developed for each research question. The models were assessed for how well they fitted the sample data. A model having a good fit of the data means that the relationships among the predictor variables are fairly accurate at predicting the outcome as per the following equations:

$$\text{Model 1 (step 1)} \ Y_i = b_0 + b_1X_{1i} + b_2X_{2i} + \dots + b_nX_{ni} + \text{error}_i$$

Predictors are entered in order of importance as per prior research.

$$\text{Model 2 (step 2)} \ Y_i = b_0 + b_1X_{1i} + b_2X_{2i} + \dots b_4X_{4i} \dots + b_nX_{ni} + \text{error}_i$$

New predictors are added to the second model.

The equation represented the models, where an outcome variable, Y_i , is predicted from the sum of predictor variables (i.e., X_{1i}), and parameters (i.e., b_1) associated with the predictor variable that quantify the relationship with the outcome variable (Field, 2013). The error term indicates that the prediction is not 100% accurate at predicting the outcome variable. The b

parameter indicates how much the outcome variable would change if the X variable was changed by one unit while all else remained the same (Harlow, 2014).

RQ1. Are Title V HSI grants and the dollar amount expenditures per FTE in instruction, academic support, and student services associated with Latinas/os' graduation rates of the fall 2007 freshmen cohort of first-time, full-time, degree-seeking students at 4-year HSIs?

The HMR analysis results revealed a large variance effect size, with an $R^2 = .71$, an adjusted $R_{adj}^2 = .68$, and a significant $F(7, 64) = 22.41, p < .001$ for the final model. The first model showed that academic support and retention were significant and positive predictors. These predictors remained significant and positive predictors in the final model. The R square change (6.6%) showed that when the predictors of interest, dollar amount expenditures in student services and grantee, were entered into the model, these had a small percentage increased in the outcome variance from the initial model ($R^2 = .64, p < .001$). In other words, their contribution to the variance in graduation rates of Latinas/os was small, and only student services was significant.

The final model indicated that dollar amount expenditures in academic support and student services, and retention were significant and positive predictors of graduation rates of Latina/o students at HSIs. The standardized β regression coefficients for retention ($\beta = .66$) showed the largest effect size, followed by amount of expenditures per FTE in student services ($\beta = .26$) and academic support ($\beta = .16$). Harlow (2014) indicated that “high absolute values ($\geq |0.30|$) indicate better predictive value” (p. 59). See Table 16 for details. The findings indicated that graduation rates of Latinas/os at HSIs were more likely to increase when there was an increase in retention rates and in the dollar amount expenditures per FTE in student services and academic support.

The final model became:

$$\begin{aligned}\text{Graduation rates of Latinas/os}_i (\text{GRLatina}/\text{o}_i) &= b_0 + b_1\text{acadsupp}_i + b_2\text{retention}_i + b_3\text{studserv}_i \\ &= -26 + (.003 \times \text{acadsupp}_i) + (.88 \times \text{retention}_i) + (.003 \times \text{studserv}_i)\end{aligned}$$

The model suggested that for unstandardized coefficients, as dollar amount expenditures per FTE in academic support increase by 1 unit, the graduation rates of Latinas/os were expected to increase by .003 units. For example, if expenditures in academic support increase by \$100 per FTE, the graduation rates of Latinas/os would be expected to increase by .3%, all else remaining the same. Similarly, if expenditures in student services were increased by \$100 per FTE, then the graduation rates of Latinas/os would be expected to increase by .3%, all else remaining the same. Regarding retention rates, if these were increased by 1%, graduation rates of Latinas/os would be expected to increase by .88%, all else remaining the same.

The model suggested that for standardized coefficients, as academic support expenditures increase by 1 standard deviation (\$731.77), graduation rates of Latinas/os would be expected to increase by .16 standard deviations. Given that the standard deviation of the graduation rates of Latinas/os was 14.2, for every \$731.77 more in expenditures per FTE in academic support, the graduation rates of Latinas/os were expected to increase by an additional 2.27% ($14.2 \times .16$) at the HSIs in the sample, all else remaining the same. Similarly, as expenditures per FTE in student services increased by 1 standard deviation (\$1,140.46), graduation rates of Latinas/os were expected to increase by .26%. Therefore, for every additional \$1,140.46 spent, the graduation rates of Latinas/os would increase by 3.69% ($14.2 \times .26$), all else remaining the same. Finally, as retention rates increased by 1 standard deviation (10.61%), the graduation rates of Latinas/os would be expected to increase by .66%. Thus, for every 10.61% increase in retention rates, the graduation rates of Latinas/os were expected to increase by 9.37% ($14.2 \times .66$), all else

remaining the same. All other predictors did not make a significant contribution to the variance in the outcome variable. See Table 10 for detailed hierarchical multiple regression results.

RQ2. Are Title V HSI grants and the percentage of expenditures per FTE in academic support and student services associated with Latinas/os' graduation rates of the fall 2007 freshmen cohort of first-time, full-time, degree-seeking students at 4-year HSIs?

Results from a hierarchical multiple regression analysis revealed that the predictor variables explained a large variance effect with $R^2 = .62$ for step one, to $R^2 = .69$ in step 2 (final model). There was a small 7.5% R square change from model one to model two. This result suggested that when *studserv_pct* and *grantee* predictors were entered into the final model, these variables contributed 7.5% to the variance in the outcome, where *studserv_pct* was the only significant contributor. Because multicollinearity presence, the percentage of expenditures in instruction predictor was removed from this analysis.

The final model was a significant fit of the data because the F-test was significant, $F(6, 65) = 24.17, p < .001$. As described earlier, due to the high correlation between instruction and student services expenditures when investigated as percentage of expenditures, only the percentage of expenditures in student services were included in the analysis. The HMR's models indicated that the percentage expenditures per FTE in academic support and student services, and retention were significant predictors of graduation rates of Latinas/os. The significant standardized β regression coefficients from the HMR showed a large effect size for retention ($\beta = .73, p < .001$), a close to a medium significant effect size for percent of expenditures per FTE in student services ($\beta = .26$), followed by a small significant effect size for percentage of expenditures in academic support ($\beta = .15$). The results revealed that the larger the percent of expenditures per FTE in student services and academic support, as well as increase in retention,

graduation rates of Latina/o students would experience increase. All other predictors did not significantly contribute to variance in the outcome variable. See Table 17 for detailed analysis results.

The final model for this question became:

Graduation rates of Latinas/os_i ($GRLatina/o_i$) = $b_0 + b_1studserv_pct_i + b_2acadsupp_pct_i +$

$b_3retention_i$

$GRLatina/o_i = -40.82 + (.53 \times studserv_pct_i) + (.39 \times b_2acadsupp_pct_i) + (.97 \times retention_i)$

The model suggested that for unstandardized coefficients, if percentage expenditures per FTE in student services increase by 1 unit, the graduation rates of Latinas/os were expected to increase by .53 units. Similarly, if percentage expenditures per FTE in academic support increase by 1%, the graduation rates of Latinas/os were expected to increase by .39%, all else remaining the same. Regarding retention rates, if these increase by 1%, graduation rates of Latinas/os were expected to increase by .97%, all else remaining the same. See Table 11 for analysis results.

RQ3. Are Title V HSI grants and the dollar amount of expenditures per FTE in instruction, academic support, and student services associated with bachelor's degrees awarded to Latinas/os by 4-year HSIs in the academic year 2012-2013?

Hierarchical multiple regression analysis resulted in a very large shared variance effect size of $R^2 = .96$, $p < .001$ for model one. The R square change was very small (.2%) from first model to second model ($R^2 = .96$, $p = .21$), which indicated that studserv and grantee predictors did not significantly contribute to the variance of the outcome variable (percent of bachelor's degrees awarded to Latinas/os). The model was a good fit of the data as the F-test was significant, $F(7,67) = 228.97$, $p < .001$. In model 1, retention and the percentage of undergraduate Latina/o students enrolled in fall 2007 ($F07pctULatino$) predictors were significantly related to

the percent of bachelor's degrees awarded to Latinas/os, but in the final model only the percentage of undergraduate Latina/o students enrolled in fall 2007 was a significant and positive predictor of the outcome variable. The standardized $\beta = 1$, $p < .001$ indicated that at the HSIs in the sample, only the fall 2007 percent of Latina/o students enrolled was a predictor of percent of bachelor's degrees awarded to Latinas/os. See Table 18 for analysis details.

The final model became:

$$\text{Percent of bachelor's degrees awarded to Latinas/os}_i (\text{pctBALatina/o}) = b_0 + b_1 \text{F07pctULatina/o}_i$$

$$\text{pctBALatina/o}_i = 1.23 + (.94 \times \text{F07pctULatina/o}_i)$$

The model suggested that for unstandardized coefficients, as the percentage of undergraduate Latinas/os in fall 2007 (F07pctULatina/o) increases by 1%, the percent of bachelor's degrees awarded to Latinas/os (pctBALatina/o) was expected to increase by .95%. For standardized coefficients, the model suggested that as the percent of undergraduate Latinas/os enrolled in fall 2007 (F07pctULatina/o) increased by 1 standard deviation (18.34), the percent of degrees awarded to Latinas/os (pctBALatina/o) was expected to increase by 1%. For pctBALatina/o with a 17.3 standard deviation, for every 17.3 increase in F07pctULatina/o, pctBALatina/o was expected to increase by 17.3%. See Table 18 for details.

Subsequent HMR analysis was performed to explore the variables of interest in this study. The fall 2007 enrollment percent of Latina/o students (F07pctULatina/o) control variable was removed, and the outcome variable was $\log_e$ transformed in question 3.1.

RQ3.1. After removing the percentage of undergraduate Latina/o students in fall 2007 control variable, are Title V HSI grants and the dollar amount of expenditures per FTE in academic support and student services associated with bachelor's degrees awarded to Latinas/os by 4-year HSIs in the academic year 2012-2013?

A hierarchical multiple regression analysis revealed large shared variance effect size $R^2 = .25$, $p < .001$. The model was a significant fit of the data, the $F(6,68) = 3.7$, $p < .05$ was significant for the final model. The model one ($R^2 = .04$, $p = .60$) was not significant, which suggested that only the predictors in the second step were significantly contributing to the percent of bachelor's degrees awarded to Latinos. The final model increased by 21% (R square change) from an initial $R^2 = .04$, $p = .6$. Results indicated that only the grantee predictor was significant and presented a moderate standardized regression coefficient ($\beta = .43$, $p < .001$). This result suggested that when an HSI was an awardee of Title V grant, this was more likely to be associated with an increased percentage of bachelor's degrees awarded to Latinas/os, as all other predictors were not significant in model 1 and model 2. See Table 19 for details.

The final model became:

$\text{Log}_e \text{Percent of bachelor's degrees awarded to Latinas/os}_i (\text{pctBALatina/o_ln}) = b_0 + b_1 \text{Grantee}_i$
 $\text{pctBALatina/o_ln} = 3.43 + (.35 \times \text{grantee})$

The result suggested that if an HSI received a Title V grant (grantee = 1), then the percent of bachelor's degrees awarded to Latinas/os from the total degrees completed and conferred would increase by $e^{.35} = 1.42\%$ increase resulting from grant, while all other variables in the model were held constant. See Table 19 for analysis details.

RQ4. Are Title V HSI grants and the percentage of expenditures per FTE in academic support and student services associated with bachelor's degree awarded to Latinas/os by 4-year HSIs in the academic year 2012-2013?

The hierarchical multiple regression analysis showed that the model explained a large shared variance effect size ($R^2=.96$, $p<.001$), and it was a good fit of the data, $F(6,68) = 268.76$, $p<.001$). Only the first model was significant, and the R square change from first to second model ($R^2 = .96$, $p = .18$) was very small (.2%). Only one predictor, the percentage of Latina/o students enrolled in fall 2007 (F07pctULatino) was a significant and positive predictor in both models, with large standardized coefficient ($\beta = 1$, $p<.001$). This indicated that only the percent of undergraduate Latinas/os enrolled in fall 2007 was a predictor of the percent of bachelor's degrees awarded to Latinas/os. Although retention was significant and positively associated with the outcome variable in model 1, the predictor did not contribute significant variance in model 2. Model one $R^2 = .96$ remained the same in step 2, $R^2 = .96$. Due to the high correlation between percentage expenditures per FTE in instruction (instruction_pct) and student services (studserv_pct) predictors, as stated earlier, only the percentage of expenditures in student services predictor was included in the analysis guided by the research of Webber and Ehrenberg (2010). See Table 20 for details.

The final model for this question appeared to be the same as the model for question 3:

$$\text{pctBALatina/o}_i = b_0 + b_1\text{F07pctULatina/o}$$

$$\text{pctBALatina/o}_i = -2.16 + (.95 \times \text{F07pctULatina/o})$$

The model suggested that for unstandardized coefficients, as the percentage of undergraduate Latinas/os in fall 2007 (F07pctULatina/o) increased by 1%, the percent of

bachelor's degrees awarded to Latinas/os (pctBALatina/o) was expected to increase by .95%.

See Table 20 for details.

Therefore, as with question 3.1, to continue exploring variables of interest in this study, a subsequent analysis was performed omitting the fall 2007 enrollment percent of Latina/o students (F07pctULatina/o) control variable, and the outcome variable was log_e transformed in question 4.1.

RQ4.1. Controlling for retention and F07pctAdmit, besides the fall 2007 undergraduate Latina/o enrollment, are Title V HSI grants and the dollar amount of expenditures per FTE in academic support and student services associated with bachelor's degrees awarded to Latinas/os by 4-year HSIs in the academic year 2012-2013?

A hierarchical multiple regression analysis showed that when the F07pctULatino control variable was removed from the analysis and the outcome variable was transformed (pctBALatino_ln) to meet regression assumptions, the final model explained a large variance effect size, $R^2 = .25$, $p < .001$. The R square change from first model ($R^2 = .05$, $p = .27$) was moderate and indicated that when studserv_pct and grantee predictors were entered into the model these had a 19.5% contribution to the outcome variable variance, and only the grantee predictor had a significant contribution to the variance. The model was a good fit of the data as the F-test was significant, $F(5,69) = 4.56$, $p < .001$. The final model showed that only the grantee predictor ($\beta = .42$, $p < .001$) contributed to the variance in the percent of bachelor's degrees awarded to Latinas/os at HSIs. See Table 21 for details.

The final model for this question resulted in the equation:

$$\text{pctBALatina/o_ln} = b_0 + b_1\text{grantee}$$

$$\text{pctBALatina/o_ln} = 2.63 + (.34 \times \text{grantee})$$

The result suggested that if an HSI received a Title V grant, then the percent of bachelor's degrees awarded to Latinas/os from the total degrees completed and conferred would increase by $e^{.34} = 1.41\%$ increase resulting from grant, while all other variables in the model are held constant. See Table 21 for analysis results.

RQ5. Are HSIs equitable in the proportion of bachelor's degrees awarded to Latinas/os?

To investigate whether HSIs are equitable in conferring degrees on Latina/o students, the Equity Index formula was used. The formula calculates the proportionality of degrees awarded to Latina/o students, accounting for the proportion of undergraduate Latina/o students enrolled six years earlier at the institution (Contreras et al., 2008). When the result of the equation is equal to 1, this indicates equity because the percentage of degrees awarded to Latinas/os is similar to the percentage of undergraduate Latina/o students enrolled six years before the degrees were awarded. Proportionality of bachelor's degrees awarded to Latina/o students was examined as per the following equation:

$$\text{HSIs' Latina/o BA Degrees Equity Index} = \frac{\text{Percent of bachelor's degrees awarded to Latinas/os in academic year 2012-2013}}{\text{Percent of undergraduate Latina/o student enrollment in fall 2007}}$$

The bachelor's degree equity index revealed that, on average, the HSIs in the sample were equitable in degrees awarded to Latinas/os. The equity index result indicates that HSIs met the cut-off standard value (1). On average, the percentage of bachelor's degrees awarded to Latinas/os in academic year 2012-2013 over the percentage of undergraduate Latinas/os enrolled in fall 2007 at the HSIs in the sample was equitable (1.08). Further examination of the degree equity index by grantee HSIs (1.03) and non-grantee HSIs (1.17) demonstrated that HSIs remained equitable in the proportion of bachelor's degrees awarded to Latinas/os, although non-

grantee HSIs awarded slightly more bachelor's degrees to Latinas/os compared to the proportion of Latinas/os enrolled in fall 2007. See Table 22 for details.

Chapter 5: Discussion

Six major findings emerged in this study. First, contrary to earlier research, expenditures in instruction had no significant association with the graduation rates of Latinas/os at HSIs in the sample. Second, consistent with the institutional action framework, the dollar amount and the percentage of expenditures in student services and academic support were significant and positive predictors of the graduation rates of Latinas/os. Third, in support of prior studies, retention was a significant predictor of graduation rates of Latinas/os and the percent of undergraduate Latinas/os in fall 2007 was not. Fourth, the percent of undergraduate Latina/o students was the only significant predictor of the percent of bachelor's degrees awarded to Latinas/os. Fifth, the Title V grant emerged as a significant predictor of the percent of bachelor's degrees awarded to Latinas/os at HSIs when the percent of undergraduate Latina/o students control variable was removed from the analysis. Lastly, the HSIs in the sample were equitable in awarding bachelor's degrees to Latinas/os.

Expenditures and Educational Outcomes of Latinas/os

Expenditures in instruction. Contrary to other studies (Astin, 1993; Gansemer-Topf, & Schuh, 2006; Garcia, 2012; Ryan, 2004; Scott et al., 2006; Webber & Ehrenberg, 2010), this study did not find dollar amount of expenditures per FTE in instruction to be a significant predictor of graduation rates of Latinas/os at HSIs in the sample. Similarly, the expenditures per FTE in instruction predictor did not have a significant association with the percentage of bachelor's degrees awarded to Latinas/os. Plausible explanations for the expenditures in instruction finding are threefold. First, the instruction expenditures category includes a wide variety of activities that influence Latina/o students' academic outcomes in different ways at HSIs in the sample, rendering the amount of dollar expenditure to be a nonsignificant predictor.

For example, the category includes the investment or lack thereof in faculty training to address student diversity, curriculum reform, and pedagogical approaches to address the needs of Latina/o students. Research has found that many faculty at HSIs have not participated in diversity training and do not use pedagogy of engagement (Castellanos & Gloria, 2007; Contreras & Contreras, 2015; Pike et al., 2006). Notwithstanding, some HSIs have made concerted efforts during orientation and other new faculty activities, to inform them about “student profile and set the vision and tone on the institution because they are the ones that interact with students” (HSI president interview, in Santiago, 2004, p. 8).

In addition, the high student-to-faculty ratios at HSIs might reduce the number of courses or course sections needed for timely graduation (Bound et al., 2012). Furthermore, for students that attend on a part-time basis, the classroom experience “is the only venue where [students] regularly have face-to-face contact with their peers as well as their teachers” (Kuh, 2011, p. 284). Latina/o student attendance pattern may necessitate that faculty work in collaboration with other institutional units (e.g., academic support, student services) for students to learn about their campus and create engagement opportunities.

Second, prior research found negative association between instruction expenditures and student-centered institutions (Hayek, 2001). This study’s findings suggested that there might be influential student-centered functions at HSIs that might be effective at student success. Thus, expenditure levels in academic support and student services were found to have a positive and significant association with Latina/o students’ graduation rates.

Lastly, the findings may also be a function of the sample data that included a wide range of HSIs. For example, some institutions spent as little as \$2,600 per FTE to a maximum of \$12,600 per FTE in instruction, and allocated a minimum of 50% to a maximum of 80% of their

budget to instruction expenditures. This wide range in instruction expenditures might have rendered the variable not significant. In addition, instruction expenditures influence on outcome variables were difficult to assess due to multicollinearity issues with other expenditure variables. Furthermore, some instruction functions and activities (e.g., remedial courses) may be budgeted in different units (i.e., instruction, academic support) depending on the institution.

Expenditures in academic support and student services. The results of this study support Tinto's (2012) framework for institutional action, which argues for the implementation of support programs to increase student success. Tinto (2012) contended for allocation of resources to units responsible for the design and management of such support programs. Academic support and student services units are central to students' activities because they have a long tradition of fostering students' success (Kuh, 2011). Academic support (e.g., development of academic personnel, and course and curriculum development) and student services (e.g., development of students outside the context of the formal instructional program) activities were key within the institutional action framework (Tinto, 2012). The results of this study found that the expenditures in academic support and student services, as either dollar amount or percentage of expenditures, were significant predictors of the graduation rates of Latina/o students at HSIs in the sample.

The findings of this study were also consistent with research that found expenditures in academic support (Garcia, 2012; Gansemer-Topf & Schuh, 2004, 2005, 2006; Ryan, 2004) and student services (Webber & Ehrenberg, 2010) to be significantly and positively associated with students' graduation rates. Contrary to earlier studies (Gansemer-Topf and Schul, 2006; Ryan, 2004), this investigation found that expenditures in student support were significant and

positively associated with graduation rates of Latinas/os. The findings suggested that HSIs ought to maintain or increase expenditures in these areas to enhance graduation rates of Latinas/os.

Concurring with Astin (1993), expenditures in student services influence graduation rates the most, particularly at less selective institutions with large proportions of low-income students (Webber & Ehrenberg, 2010). These are characteristics similar to those of many HSIs. Considering that, HSIs enroll a great proportion of first-generation and less academically prepared students (de los Santos & Cuamea, 2010) academic support and student services may play key roles in their educational attainment in the long-term. For example, advising, counseling, and mentoring programs offered by these units have been associated with Latinas/os' retention and graduation rates (Berrios-Allison, 2011; Salas et al., 2014; Torres & Hernandez, 2010). Also, some HSIs include students' family members to orientation and other activities "so they can understand what is required for getting a university education" (HSI president interview, in Santiago, 2004, p. 3)

Furthermore, HSIs with long tradition of enrolling Latina/o students may have institutionalized programs to address the educational needs of Latinas/os. Particularly HSIs that received Title V awards, these institutions had to develop plans to compete for such funds. These programs might have been the product of institutional stakeholders (i.e., faculty, student services, academic support, and students) who collaborated in creating and enacting "policies, programs, and practices known to have desired effects on various dimensions of student performance" (Kuh, 2011, p. 277). For example, summer bridge programs that were coherently connected to other support programs throughout the student's academic career, developed by faculty and staff, have been found to have long-term impact on student success (Tinto, 2012).

Notwithstanding the above, expenditures in academic support and student services were not significantly associated with the percent of bachelor's degrees awarded to Latinas/os. This was an intriguing finding in need of further investigation. In the analysis in which a control variable was removed (F07pctULatina/o), the percentage of expenditures in academic support had a positive association with the percent of bachelor's degrees awarded to Latinas/os, but when other variables (student services and Title V) were included in the final model, it was no longer a significant predictor. A plausible explanation is that these expenditure areas are too broad to determine how they contribute to a student's degree attainment over time by student attendance patterns (i.e., transfer).

Retention. As expected, retention rates from year-one-to-year-two had a significant and positive association with graduation rates of Latinas/os at the HSIs in the sample. The larger the proportion of students in a cohort who advance to their second year at the same institution, the larger the proportion of those students who increase their likelihood of graduating. The HSIs in the sample could have found various opportunities to enhance the cohort's graduation rates by providing support programs focused on the first-year students. Research has found this period to have the largest rate of attrition (Tinto, 2012).

However, retention rates did not have a significant relationship with the percentage of bachelor's degrees awarded to Latinas/os. This was an intriguing finding worth further examination, particularly because Title V HSI grantees had the lowest retention rates and the highest percent of bachelor's degrees awarded to Latina/o students. Latina/o students' attendance patterns (i.e., transfer, part-time, stop out) might be a factor associated with this finding because they render retention indicators irrelevant (Contreras & Contreras, 2015; Ronco, 1996, in Adelman, 2006). The finding suggested that a large proportion of Latina/o students took longer

than six years to complete their bachelor's degrees, and was not accounted for in the retention rates of the cohort under examination. In addition, graduation rates have become a less accurate measure of students' degree attainment because students attend multiple institutions, starting their careers in one institution and concluding them in others (Adelman, 1999).

Percent of undergraduate Latinas/os. The finding is consistent with Garcia (2012); the percent of Latina/o students is not a significant predictor of Latina/o students' graduation rates in the academic year 2012-2013. However, the percent of undergraduate Latina/o students was the only significant predictor of the percentage of bachelor's degrees awarded to Latinas/os. A debatable point would be that the demographics of students captured in fall 2007 might not be the same as those of the students awarded a bachelor's degree six years later at a given HSI. Unlike the cohort measurement, which tracks the same group of students and their graduation rates, the degrees awarded in a given year count students who complete a degree. Degree completion does not take into account how long a student was enrolled at the institution. This phenomenon is a particular characteristic of HSIs, whose students have varied attendance patterns (Nunez et al., 2011) and which experience the rapid enrollment increase pattern characteristic of Latina/o students (HACU, 2015).

Title V HSI Grants

A Title V grant was a significant predictor of the percent of bachelor's degrees awarded to Latinas/os at the HSIs after the control variable accounting for the percent of undergraduate Latina/o students was removed from the analysis. This finding suggested that a Title V grant was associated with students who took longer than the 150% time to complete an academic program. Hence, the significant association could reflect those programs and services implemented with

Title V grants to support Latina/o students, who tend to take longer to graduate (Contreras & Contreras, 2015).

Title V grantees received funds for 5-year spans to implement and assess programs that directly benefit the academic outcome of Latino students. Unlike Title V grant, which funds are targeted to specific student programs, educational expenditures cover a broad range of programs difficult to assess on particular student groups (i.e., Latinos). Title V grant may have rendered other expenditures statistically not significantly associated with the percent of bachelor's degrees awarded to Latinos in the academic year 2012-2013. Additionally, Title V grantee HSIs with a focused program to serve Latino students may have an environment that made these students feel validated and supported by their academic community (Reason, Terenzini, & Domingo, 2007; Salas, Aragon, Alandejani, & Timpson, 2014; Toews & Yazedjian, 2010). Furthermore, large proportion of Latino student body may have decrease negative perceptions of the college environment that some Latino students experience at PWIs (Hurtado & Carter, 1997; Hurtado & Ponjuan, 2005).

This finding provides further support for Tinto's (2012) institutional action framework. Programs designed for students' success can make a difference in the academic outcomes of Latina/o students and in an institution's accountability measures (i.e., completions). In accordance with the tenets of the institutional action framework, Title V programs detail goals and measurable objectives, and practice assessment, to increase the likelihood of academic success for students who participate in such programs. In addition, analogous to HBCU's traditional mission to serve African American students, HSIs that become Title V grantees may have developed a tacit, if not explicit, "Latina/o-serving" mission. This study revealed that HSIs that were recipients of a Title V grant awarded a larger proportion of bachelor's degrees to

Latinas/os compared to non-grantee HSIs, even though they had lower financial resource levels per FTE. This might be due to strategic and intentional practices, and not to financial resources (Gansemer-Topf, Saunders, Schuh, & Shelley, 2004).

Equity in Awarding Degrees

The finding of this study was consistent with other research which documented that HSIs greatly contribute to Latinas/os educational standing (Harmon, 2012; Laden, 1998, 2001). A great proportion of the total degrees awarded by HSIs were awarded to Latinas/os. Conversely to Contreras et al. (2008), this study found that the HSIs in the sample awarded bachelor's degrees proportionately to undergraduate Latina/o students enrolled in fall 2007. The finding difference may be due to the sample used in this study. In addition, this study assessed the percent of undergraduate Latina/o student enrollment six, rather than four, years before degree completion. A caveat on this finding is that, when the sample was separated by Title V grantee HSIs versus non-grantee HSIs, both groups achieved the equity score (1), although non-grantee HSIs scored slightly higher than grantee HSIs.

Limitations and Recommendations for Future Research

This study found that Latina/o graduation rates and bachelor's degrees awarded to Latinas/os at HSIs were associated with retention, expenditures per FTE in academic support and student services, Title V grants, and undergraduate Latina/o enrollment. A limitation of the data was that these were collected to comply with federal regulations and their level of detail is limited. For example, instruction expenditures can include departmental research and public service activities that might not be directly related to instruction. Also, academic support expenditures include academic administration (e.g., deans) that--depending on the institution--may or may not have a direct association with students' learning. These types of expenditures are

not always associated with students' direct learning activities. Although higher education institutions are already burdened with compliance activities, IPEDS could further segregate data into more meaningful data points to measure student learning beyond institutional retention and graduation rates measures.

The Title V HSI grant was included in the study as a dichotomous predictor. This study did not distinguish the type of activities funded by a Title V grant. Future research could disaggregate Title V programs by activities and dollars spent. This approach could provide a clearer examination of whether Latina/o students are fully benefitting from Title V funded initiatives. This may require qualitative research methods to examine Title V reports submitted to the USDE by HSIs in addition to program participants' data. For instance, document analyses of the projects submitted by HSIs institutions to the USDE. Document analysis of the project should focus on identifying the goals, objectives, and accountability measurement to compare against annual progress reports to understand whether the Title V investments had an impact on Latina/o students' educational outcomes. This approach could also entail interviews with students, staff, and faculty involved in the creation of the initial project submitted to the USDE to obtain a sense of the level of involvement from the different institutional constituencies. In addition, interviews with personnel at the institution involved with the actual implementation and day-to-day management of the program, if different from the initial document creation individuals. Document content analysis should engage in finding common themes to point to issues that need to be improved for the program to achieve its mandated intentions. Qualitative analysis might also be performed through web-based surveys via email link to elicit staff, faculty, and students experiences with the Title V funded program at their institution. The survey might have a qualitative component where survey participants can express their opinions in a free text

format to open-ended questions. The survey could also have a quantitative component, where survey participants select from a multiple choice and Likert type scales questions. Data from online surveys can be analyzed using multivariate techniques. Many institutions of higher education have access to survey software such as Qualtrics and SurveyMonkey to name two of many, for creating surveys and performing preliminary survey response analyses.

Further quantitative analysis would require collecting and analyzing the data of students who participated in the program. This data should be protected under data governance and FERPA related laws and regulation. Therefore, in most instances, a formal IRB protocol would have to be completed to have access to student data for research (publication). Student data should contain student's courses, grades, semester, and credit hours, in addition to demographic related information, among possible data points. Most importantly, the particular component or service (e.g., time management skill workshops, math drilling, writing) of the Title V funded program the student participated in and for how long (e.g., number of hours, sessions, etc.). Examining each component of the service provided by the program could increase understanding of areas that need improvement, and which areas are really making a difference in a student's academic performance. Additional quantitative approaches could include creating a comparable group to the students that participated in the program based on similarities such as courses taken, standardized test scores, GPA, SES, etc. The comparable group, which did not participate in the Title V sponsored program, would function as a control to measure whether students that participated in the program gained in academic performance, retention, or additional stated goals of the program.

Although IPEDS survey indicates government grants as a percent of core revenues and per FTE, there are no details on where a particular grant is budgeted and in which educational

expenditure area. Therefore, this study is limited to whether an HSI received Title V grant funds or not. Examination of Title V funding could also explore allocation structure of such funds (i.e., instruction, academic support, etc.) to gain an understanding as whether investing such funds in particular administrative areas can be more effective at directly influencing student learning.

This study limited its scope to 4-year public and private not-for-profit institutions that award bachelor's degrees and have at least a 1000-student enrollment. Additionally, the sample was limited to only those Title IV participants located in the continental U.S. with 25% or more undergraduate Latina/o enrollment in fall 2012. The study focused its examination on one cohort because it had the most recent data at the time of this study. Therefore, the findings may differ from similar studies that used different cohorts in conjunction with other variables not included in this study. The study evaluated HSIs' expenditures in instruction, academic support, and student services. However, higher education institutions report other types of expenditures and revenue sources that could be incorporated in future research to gain a greater understanding of HSIs.

The scope of the study did not include 2-year institutions that provide educational opportunities to undergraduate Latinas/os pursuing higher education. Future research could use 2-year colleges to explore the role of Title V grants and Latina/o students' outcomes. Two-year colleges enroll a large proportion of undergraduate Latina/o students and many are HSIs. Additionally, HSIs have very diverse student bodies, so future research could investigate other student groups, by sex, in combination with other HSI characteristics such as cost of attendance, and student attendance (i.e., part-time) and transfer patterns. More importantly, future research could focus on how policies and articulation agreements between 2- and 4-year HSIs make them more competitive for Title V funds that will serve Latina/o populations.

Future research could include student-level data from the NCES and other national surveys such as CIRP, NSSE, BPS, and the American Survey of Colleges, among others. Larger data sets could include other variables of interest such as student characteristics and different institutional characteristics related to student learning. Lastly, future research could use other statistical approaches, such as structural equation modeling, to examine longitudinal data or latent variables.

Lastly, the findings of this study are ex post facto and there were no inferences as to the causal effects of Title V grants and educational expenditures on the educational outcomes of Latinas/os at HSIs. Due to limited sample size, the regression variances do not include other institutional or student characteristics. In addition, when percentage of expenditures were examined, two predictors (instruction_pct and studserv_pct) had large correlations, which presented a multicollinearity problem. This can “occur when the sum of the predictors must equal a constant value” (Cohen et al., 2003, p. 420), such as the sum of the three predictors as the total educational expenditure in this study. Therefore, one predictor (instruction_pct) was dropped from the analyses that investigated the percentage of educational expenditures and their association with the outcome variables.

Conclusion and Implications

This study found that 4-year HSIs contribute to the bachelor’s degree attainment of Latinas/os. Overall, these HSIs were equitable in awarding bachelor’s degrees in proportion to the Latina/o students enrolled. Title V grants, awarded to HSIs with lower overall average levels of educational expenditures, were found to be significantly associated with the percent of bachelor’s degrees awarded to Latinas/os. This might be an indication that these HSIs have developed a Latina/o serving culture and institutionalized programs to increase student success.

For example, to compete for Title V funds, an institution proactively and intentionally engages in creating a plan to increase the educational attainment of Latina/o students. HSIs might have involved a great proportion of the academic community in the development of a program plan, subsequently, creating a culture or identity in support of Latina/o students, and become accountable for the use of Title V grant. Additionally, Title V HSI grantees might have developed internal accountability measures that better reflect attendance pattern of their students (i.e., Latinas/os) such as 8- to 10-year graduation rates, rather than only traditional retention and graduation rates measures as reported to IPEDS. Traditional retention and graduation rates measures might underestimate HSIs effectiveness.

According to Santiago (2012), an institution that intentionally serves its Latina/o students “is demonstrated by broad campus awareness of the profile of the Hispanic population at an institution and in the community” (p. 166). Although Title V grants are awarded for five years, Title V grant awardees might have institutionalized programs before and long after receipt of grant for serving the student communities. The findings of this study may contribute to higher education leaders’ preparations for Latina/o students and their pursuit of Title V grants, and may encourage policy makers to continue to fund HSIs and promote their role in advancing Latinas/os’ education and economic standing.

The findings of this study also contribute to understanding allocation of educational resources at HSIs. Expenditures in student services and academic support were significant predictors of graduation rates of Latinas/os. Consistent with the institutional action framework, these areas provide programs that promote student success in support of academic activities and other activities outside of formal instructional activities. Latina/o students may be benefiting from these types of programs because they tend to have greater academic needs and to require

new skills to navigate the higher education environment. Higher education policy makers at HSIs may consider this information when allocating limited resources to programs that empirical research has found to be effective at student success. For instance, learning communities have been a common student engagement strategy. In learning communities, students take courses as a cohort and are afforded the opportunity to engage with peer students and faculty. Because students take several courses together, they develop social interaction with other students, which tend to last for most of their academic careers. Research has found that learning communities experience increases retention and give students a sense of belonging to the academic community. There are a variety of learning communities. Some have a common theme or problem to attract students and direct their learning around a subject. Learning communities are learning environments where students connect course content into an integrated and interdisciplinary learning experience. Most learning communities practice pedagogies of engagement, and faculty and staff work in collaboration to provide students with a continuum inside/outside classroom learning experiences. These communities tend to be safe and protected spaces for students to learn with constant support to increase their likelihood of course success. “Students not only pursue a common body of knowledge but also share the experience of gaining that knowledge together” (Tinto, 2012, p. 71).

This study also found that expenditures in instruction were not a significant predictor of graduation rates of Latinas/os at HSIs. This finding was unexpected and suggested that there is a need to explore the activities of expenditures in instruction. Particularly at the classroom level, where students interact with faculty and peer students. The unanticipated result may be a factor of the large student to faculty ratios at the HSIs. Large size classes limit interactions between faculty and students. In addition, research has found that faculty “remain far from understanding

the first-generation backgrounds, cultures, or lived experiences of the students they are expected to teach” at HSIs (Contreras & Contreras, 2015, p. 158). Furthermore, some Latina/o students have experienced “invalidating classroom curriculum and pedagogy, and unsupportive and demeaning faculty interactions (Castellanos & Gloria, 2007, p. 381).

Nevertheless, classroom involvement and student-faculty interaction increase student engagement. Particularly when learning activities “are seen as meaningful and validating, leads to time and effort students put into their studies, which, in turn, heightens academic performance and retention” (Tinto, 2012, p. 65). The use of pedagogy of engagement in class, such as cooperative group work, provide opportunities for students to engage with other students. Collaborative group work and problem-based learning (PBL) also promote social involvement with activities that can take place inside and outside the classroom. Some institutions use PBL as active learning strategies where students collaborate with one another, use their creativity, and apply critical thinking skills to solve problems. The engagement opportunities afforded to students when working in groups also increases students’ sense of belonging. Research has found that students with a strong sense of belonging to her/his academic and social communities on campus increase institutional retention.

In conclusion, the results of this study contribute to the understanding of the relationships among Title V grants, educational expenditures, and Latinas/os’ educational outcomes at HSIs. In particular, the results contribute to the understanding of the association between expenditures in academic support and student services with Latina/o students’ graduation rates at HSIs. The results of the study were also consistent with Tinto’s (2012) institutional action framework, whereby institutions create programs to promote student success. In general, Title V grant funds are used for support programs to increase Latina/o students’ educational attainment. Due to the

generally low financial resource levels at HSIs, an institutional strategy could focus on understanding Latina/o students' learning needs, and on raising funds to establish programs designed to increase retention and promote student success, primarily for first-year, first-generation, low-income Latina/o students.

References

- 20 U.S. Code § 1101a (n.d.). Title 20 Chapter 28 Subchapter V Part A Hispanic-Serving Institutions. Retrieved from <https://www.law.cornell.edu/uscode/text/20/chapter-28/subchapter-V/part-A>
- academic support (n.d.) In *IPEDS glossary*. Retrieved from <https://surveys.nces.ed.gov/ipeds/VisGlossaryAll.aspx>
- Adelman, C. (1999). Answers in the Tool Box: Academic intensity, attendance patterns, and bachelor's degree attainment. Washington, DC: U.S. Department of Education. Retrieved from <https://eric.ed.gov/?id=ED431363>
- Adelman, C. (2006). The toolbox revisited: Paths to degree completion from high school through college. *US Department of Education*. Retrieved from <http://eric.ed.gov/?id=ED490195>
- American Association for Higher Education [AAHE] (1992). Principles of good practice for assessing student learning. Retrieved from <http://www.learningoutcomesassessment.org/PrinciplesofAssessment.html>
- American Institutes of Research [AIR] (n.d.). Delta Cost Project Database. Retrieved from <http://www.deltacostproject.org/delta-cost-project-database>.
- Arbona, C., & Nora, A. (2007). The influence of academic and environmental factors on Hispanic college degree attainment. *The Review of Higher Education*, 30(3), 247-269. doi: [10.1353/rhe.2007.0001](https://doi.org/10.1353/rhe.2007.0001)
- Ary, D., Jacobs, L. C., Razavieh, A., & Sorensen, C. (2010). *Introduction to research in education* (8th ed.). Belmont, CA: Thompson-Wadsworth.

- Association for the Study of Higher Education [ASHE] (2013). *Latina/os in higher education and Hispanic-Serving Institutions: Creating conditions for success*. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/aehe.v39.1/issuetoc>
- Astin, A. W. (1993). *What matters in college? Four critical years revisited*. San Francisco, Calif: Jossey-Bass.
- Astin, A. W., Banta, T. W., Cross, K. P., El-Khawas, E., Ewell, P. T., Hutchings, P., & Moran, E. (1996). 9 principles of good practice for assessing student learning. *AAHE Bulletin*, 45(4). Retrieved from https://scholar.google.com/scholar?q=Principles+of+Good+Practice+for+Assessing+Student+Learning&hl=en&as_sdt=1,44
- Baez, B., Gasman, M., Turner, C. S. (2008). On minority-serving institutions. In C. V. Turner, B. Baez & M. Gasman (Eds.), *Understanding Minority-serving Institutions* (pp. 2-17). Albany, NY: State University of New York Press.
- Barefoot, B. O. (2004). Higher education's revolving door: Confronting the problem of student drop out in US colleges and universities. *Open Learning: The Journal of Open, Distance and e-Learning*, 19(1), 9-18. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/0268051042000177818>
- Barefoot, B. O. (2005). Foreword. In Tobolowsky, B. F. (2005). *The 2003 national survey on first-year seminars: Continuing innovations in the collegiate curriculum* (Monograph No. 41). Retrieved from <https://eric.ed.gov/?q=first+year+seminar+historical&ft=on&id=ED503171>

- Baum, S., Ma, J., & Payea, K. (2013). Education pays: The benefits of higher education for individuals and society. Retrieved from <http://www.rilin.state.ri.us/Special/ses15/commdocs/Education%20Pays,%20The%20College%20Board.pdf>
- Bensimon, E. M. (2004). The diversity scorecard. *Change*, 36(1), 44-52. Retrieved from https://cue.usc.edu/files/2016/01/Bensimon_The-Diversity-Scorecard.pdf
- Berrios-Allison, A. C. (2011). Career support group for Latina/o/a college students. *Journal of College Counseling*, 14(1), 80-96. Retrieved from <http://go.galegroup.com/ps/anonymous?id=GALE%7CA255085847&sid=googleScholar&v=2.1&it=r&linkaccess=fulltext&issn=10990399&p=AONE&sw=w&authCount=1&isAnonymousEntry=true>
- Bound, J., Lovenheim, M. F., & Turner, S. (2010). Why have college completion rates declined? An analysis of changing student preparation and collegiate resources. *American Economic Journal: Applied Economics*, 2(3), 129-157. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3140225/>
- Bound, J., Lovenheim, M. F., & Turner, S. (2012). Increasing time to baccalaureate degree in the United States. *Education Finance and Policy*, 7(4), 375-424. Retrieved from <http://aefpweb.org/journal>
- Brown-Jeffy, S., & Cooper, J. E. (2011). Toward a conceptual framework of culturally relevant pedagogy: An overview of the conceptual and theoretical literature. *Teacher Education Quarterly*, 38(1), 65-84. Retrieved from http://www.jstor.org/stable/23479642?seq=1#page_scan_tab_contents

- Cabrera, A. F., Nora, A., & Castaneda, M. B. (1992). The role of finances in the persistence process: A structural model. *Research in Higher Education*, 33(5), 571-593. Retrieved from <https://eric.ed.gov/?id=ED345599>
- Calderon Galdeano, E., Flores, A. R., & Moder, J. (2012). The Hispanic association of colleges and universities and Hispanic-serving institutions: Partners in the advancement of Hispanic higher education. *Journal of Latina/os and Education*, 11(3), 157-162. doi: 10.1080/15348431.2012.686352
- Cambridge-Williams, T., Winsler, A., Kitsantas, A., & Bernard, E. (2013). University 100 orientation courses and living-learning communities boost academic retention and graduation via enhanced self-efficacy and self-regulated learning. *Journal of College Student Retention: Research, Theory & Practice*, 15(2), 243-268. Retrieved from http://winslerlab.gmu.edu/pubs/CambridgeWilliams_etal_In_Press.pdf&hl=en&sa=T&oi=gsb-gga&ct=res&cd=0&ei=rC0FWI7dItWEjAGwqYmYDg&scisig=AAGBfm2sjK9KtBUwv b-MbSQ7QR5QzSq4Jw
- Carey, K. (2005). Choosing to improve: Voices from colleges and universities with better graduation rates. Retrieved from <http://www.citeulike.org/group/6270/article/3134191>
- Castellanos, J., & Gloria, A. M. (2007). Research considerations and theoretical application for best practices in higher education Latina/os achieving success. *Journal of Hispanic Higher Education*, 6(4), 378-396. Retrieved from <http://jhh.sagepub.com/content/6/4/378.short>

- Cejda, B., Caspari, C., & Rhodes, J. (2002). Influences on the educational decision of Hispanic students enrolled on Hispanic serving institutions. Retrieved from <http://eric.ed.gov/?id=ED467858>
- Cohen, J. (1992). Statistical power analysis. *Current Directions in Psychological Science*, 1(3), 98-101. doi:10.1111/1467-8721.ep10768783
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral science*. New York, NY: Routledge.
- College Board (2009). *How colleges organize themselves to increase student persistent: Four-year institutions*. Retrieved from <https://research.collegeboard.org/publications>
- completions (n.d.) In *IPEDS glossary*. Retrieved from <https://surveys.nces.ed.gov/ipeds/VisGlossaryAll.aspx>
- Contreras, F. E. (2005). Access, achievement, and social capital: Standardized exams and the Latina/o college-bound population. *Journal of Hispanic Higher Education*, 4(3), 197-214. Retrieved from https://scholar.google.com/scholar_url?url=http://citeseerx.ist.psu.edu/viewdoc/download%3Fdoi%3D10.1.1.1006.1010%26rep%3Drep1%26type%3Dpdf&hl=en&sa=T&oi=gsb-gga&ct=res&cd=0&ei=s1PJWIqdKMKSjAHT2oeQAw&scisig=AAGBfm2IRnMWdn7L-fA3QKlz5gIqQ_ct6w
- Contreras, F. E., Malcom, L. E., & Bensimon, E. M. (2008). Hispanic serving institutions: Closeted identity and the production of equitable outcomes for Latina/o/a students. In M. Gasman, B. Baez, & C. S. Turner (Eds.), *Understanding minority serving institutions* (pp. 71-110). Albany, NY: State University of New York Press.

- Contreras, F., & Contreras, G. J. (2015). Raising the bar for Hispanic serving institutions: An analysis of college completion and success rates. *Journal of Hispanic Higher Education*, 14(2), 151-170. doi: 10.1177/1538192715572892
- Cuellar, M. (2014). The impact of Hispanic-serving institutions (HSIs), emerging HSIs, and non-HSIs on Latina/o academic self-concept. *Review of Higher Education*, 37(4), 499-530. doi: 10.1353/rhe.2014.0032
- Cuellar, M. (2015). Latina/o student characteristics and outcomes at four-year Hispanic-serving institutions (HSIs), emerging HSIs, and non-HSIs. In A. M. Nunez, S. Hurtado, E. Calderon Galdeano (Eds.), *Hispanic-serving institutions: Advancing research and transformative practice* (101-120). New York, NY: Routledge.
- Danforth, M. (2015). Title V – DHSI Annual performance report. California State University. Unpublished report. FOIA request.
- de los Santos, A. G., & Cuamea, K. M. (2010). Challenges facing Hispanic-serving institutions in the first decade of the 21st century. *Journal of Latina/os and Education*, 9(2), 90-107. doi:10.1080/15348431003617798
- DeFreitas, S. C., & Bravo Jr, A. (2012). The influence of involvement with faculty and mentoring on the self-efficacy and academic achievement of African American and Latina/o college students. *Journal of the Scholarship of Teaching and Learning*, 12(4), 1-11. Retrieved from <https://eric.ed.gov/?id=EJ992123>
- Excelencia in Education (n.d.). Growth: HSIs, emerging HSIs, graduate HSIs, 1994-95 to 2013-14. Retrieved from <http://www.edexcelencia.org/hsi-cp2/research/growth-hsis-emerging-hsis-graduate-hsis-1994-95-2013-14>

Excelencia in Education (n.d.). Hispanic-serving institutions (HSIs): 2014-15. Retrieved from

<http://www.zxcv.edexcelencia.org/research/hsis-2014-15>

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Los Angeles, CA: Sage.

Fischer, M. J. (2007). Settling into campus life: Differences by race/ethnicity in college involvement and outcomes. *Journal of Higher Education*, 125-161. Retrieved from http://www.jstor.org/stable/4501200?seq=1#page_scan_tab_contents

Flores, S. M., & Park, T. J. (2013). Race, ethnicity, and college success examining the continued significance of the minority-serving institution. *Educational Researcher*. doi: 0013189X13478978.

Flores, S.M., & Park, T. J. (2015). The effect of enrolling in a minority-serving institution for Black and Hispanic students in Texas. *Research in Higher Education*, 56(3), 247-276. doi:10.1007/s11162-014-9342-y

Fry, R. (2002). Latina/os in Higher Education: Many Enroll, Too Few Graduate. Retrieved from <http://files.eric.ed.gov/fulltext/ED468848.pdf>

Fry, R. (2004). Latina/o youth finishing college: The role of selective pathways. *Pew Hispanic Center*. Retrieved from <http://eric.ed.gov/?id=ED528603>

Gansemer-Topf, A. M., Saunders, K., Schuh, J. H., & Shelly, M. (2004). *A Study of Resource Expenditures and Allocation at DEEP Colleges and Universities: Is Spending Related to Student Engagement?*. Retrieved from http://nsse.indiana.edu/pdf/DEEP_Expenditures_Schuh.pdf

Gansemer-Topf, A. M., & Schuh, J. H. (2004). Instruction and Academic Support Expenditures:

An Investment in Retention and Graduation. *Journal of College Student Retention:*

Research, Theory & Practice, 5(2), 135-145. Retrieved from <http://baywood.com>

Gansemer-Topf, A., & Schuh, J. H. (2005). Institutional grants: Investing in student retention

and graduation. *Journal of Student Financial Aid*, 35(3), 5-20. Retrieved from

http://www.nasfaa.org/research/Journal/Journal_of_Student_Financial_Aid.aspx

Gansemer-Topf, A., & Schuh, J. H. (2006). Institutional selectivity and institutional

expenditures: Examining organizational factors that contribute to retention and

graduation. *Research in Higher Education*, 47(6), 613-642. doi:10.1007/s11162-006-

9009-4

Garcia, G. A. (2012). Does percentage of Latinas/os affect graduation rates at 4-year Hispanic

serving institutions (HSIs), emerging HSIs, and non-HSIs? *Journal of Hispanic Higher*

Education, 12(3), 256-268. doi: 10.1177/1538192712467203

Gasman, M. (2008). Minority-serving institution: A historical backdrop. In C. V. Turner, B. Baez

& Gasman, M. (Eds.), *Understanding Minority-serving Institutions* (pp. 18-27). Albany,

NY: State University of New York Press.

Gonzales, S. M., Brammer, E. C., & Sawilowsky, S. (2015). Belonging in the academy building

a “casa away from casa” for Latina/o/a undergraduate students. *Journal of Hispanic*

Higher Education, 14(3), 223-239. Retrieved from

<http://jhh.sagepub.com/content/14/3/223.short>

González, K. P., & Ballysingh, T. A. (2012). Increasing Latina/o college completion: Mistakes

and opportunities. *Journal of Hispanic Higher Education*. doi: 1538192712437934.

graduation rates (n.d.) In *IPEDS Glossary*. Retrieved from

<https://surveys.nces.ed.gov/ipeds/Downloads/Forms/IPEDSGlossary.pdf>

Harlow, L. L. (2014). *The essence of multivariate thinking: Basic themes and methods*. New York, NY: Routledge.

Harmon, N. (2012). The role of minority-serving institutions in national college completion goals. *Institute for Higher Education Policy* [serial online]. Retrieved from <http://eric.ed.gov/?id=ED528603>

Harper, S. R. (2011) Strategy and intentionality on practice. In J. H. Schuh, S. R. Jones, S. R. Harper, R. Shaun (Eds.). *Student Services: A Handbook for the Profession* (pp. 308-325). San Francisco: Jossey-Bass.

Harring-Hendon, J. (2015). Title V- DHSI annual performance report. Unpublished report. FOIA obtained.

Hayek, J. C. (2001). *A student-centered approach for identifying high-performing colleges and universities* (Doctoral dissertation). Retrieved from ProQuest Information and Learning. (UMI No. 3024295)

Heller, D. E. (2013). The role of finances in postsecondary access and success. In *The State of College Access and Completion: Improving College Success for Students from Underrepresented Groups*. (pp. 96-114). Taylor and Francis. doi: [10.4324/9780203074091](https://doi.org/10.4324/9780203074091)

Higher Education Act of 1965, 20 U.S.C §§ 1101-1103g (2013). Retrieved from http://legcounsel.house.gov/Comps/HEA65_CMD.pdf

- Hispanic Association of Colleges and Universities (HACU, n.d.). 2016 Fact sheet: Hispanic higher education and HSIs. Retrieved from http://www.hacu.net/hacu/HSI_Fact_Sheet.asp
- Horn, L. (2006). *Placing college graduation rates in context: How 4-year college graduation rates vary with selectivity and the size of low-income enrollment* (NCES 2007-161). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from <https://nces.ed.gov/search/?q=selectivity>
- Hurtado, S., & Alvarado, A. R. (2015). Realizing the potential of Hispanic-Serving Institutions: Multiple dimensions of organizational transformation. In A. M. Nunez, S. Hurtado, E. Calderon Galdeano (Eds.), *Hispanic-Serving Institutions: Advancing research and transformative practice* (25-46). New York, NY: Routledge.
- Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate on Latina/o college students' sense of belonging. *Sociology of education*, 324-345. Retrieved from http://www.jstor.org/stable/2673270?seq=1#page_scan_tab_contents
- Hurtado, S., & Ponjuan, L. (2005). Latina/o educational outcomes and the campus climate. *Journal of Hispanic Higher Education*, 4(3), 235-251. Retrieved from <http://jhh.sagepub.com/content/4/3/235.short>
- Hutchings, P. (2010). Opening doors to faculty involvement in assessment. NILOA Occasional Paper, 4. Retrieved from <http://atlantic.edu/about/research/documents/OpeningDoorstoFacultyInvolvement.pdf&hl=en&sa=T&oi=gsb->

gga&ct=res&cd=1&ei=N3LJWO__D8WwjAHt4Yu4CQ&scisig=AAGBfm1swlhHfQqp
VU8TOD4EV3fLOYesHw

instruction (n.d.) In *IPEDS Glossary*. Retrieved from

<https://surveys.nces.ed.gov/ipeds/Downloads/Forms/IPEDSGlossary.pdf>

Krogstad, J. M. (2016). Five facts about Latina/os and education. Retrieved from

http://www.pewresearch.org/fact-tank/2016/07/28/5-facts-about-Latina/os-and-education/?utm_source=Pew+Research+Center&utm_campaign=9dca022fe6-_Weekly_July_28_20167_28_2016&utm_medium=email&utm_term=0_3e953b9b70-9dca022fe6-400185937

Kuh, G. D. (2011). Student success. In J. H. Schuh, S. R. Jones, S. R. Harper, R. Shaun (Eds.).

Student Services: A Handbook for the Profession (pp. 276-289). San Francisco: Jossey-Bass.

Laden, B. V. (1998). Celebratory socialization: Welcoming Latina/o students to college.

Retrieved from <http://eric.ed.gov/?id=ED429523>

Laden, B. V. (2001). Hispanic-serving institutions: Myths and realities. *Peabody Journal of*

Education, 76(1), 73-92. Retrieved from

http://www.tandfonline.com/doi/abs/10.1207/S15327930PJE7601_05

Maestas, R., Vaquera, G. S., & Zehr, L. M. (2007). Factors impacting sense of belonging at a

Hispanic-serving institution. *Journal of Hispanic Higher Education*, 6(3), 237-256.

Retrieved from <http://jhh.sagepub.com>

- Malcom, L. E., Bensimon, E. M., & Davila, B. (2010). (Re)constructing Hispanic-serving institutions: Moving beyond numbers toward student success. *Education Policy and Practice Perspectives*, 6, 1-8. Retrieved from <http://cue.usc.edu/publications/briefs-reports-papers/>
- Malcom-Piqueux, L. E., & Lee, J. J.(2011). Hispanic-Serving Institutions: Contributions and Challenges. Policy Brief. Retrieved from <https://eric.ed.gov/?id=ED562686>
- Merisotis, J. P., & McCarthy, K. (2005). Retention and student success at minority-serving institutions. *New Directions for Institutional Research*, 2005(125), 45-58. Retrieved from www.interscience.wiley.com
- Morrison, M. C. (2013). Graduation odds and probabilities among baccalaureate colleges and universities. *Journal of College Student Retention: Research, Theory & Practice*, 14(2), 157-179. Retrieved from <http://journals.sagepub.com/doi/abs/10.2190/CS.14.2.a>
- Musoba, G. D., & Krichevskiy, D. (2014). Early coursework and college experience predictors of persistence at a Hispanic-serving institution. *Journal of Hispanic Higher Education*, 13(1), 48-62. Retrieved from <http://jhh.sagepub.com>
- Musoba, G. D., Collazo, C., & Placide, S. (2013). The first year: Just surviving or thriving at an HSI. *Journal of Hispanic Higher Education*. doi: 1538192713497222.
- Musu-Guillette, L., Robinson, J., McFarland, J., KewalRamani, A., Zhang, A., & Wilkinson-Flicker, S. (2016). *Status and trends in the education of racial and ethnic groups 2016* (NCES 2016-007). U.S. Department of Education, National Center for Education Statistics. Washington, DC. Retrieved from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2016007>

National Assessment of Educational Progress [NAEP] (2015). The nation's report card:

Mathematics and reading at grade 12. Retrieved from

http://www.nationsreportcard.gov/reading_math_g12_2015/

National Center for Education Statistics [NCES] (n.d.). Fast facts: Tuition costs of colleges and

universities. Retrieved from <http://nces.ed.gov/fastfacts/display.asp?id=76>

National Center for Education Statistics [NCES] (n.d.). Fast facts: Educational attainment.

Retrieved from <https://nces.ed.gov/fastfacts/display.asp?id=27>

National Center for Education Statistics [NCES] (n.d.). Table 306.20, Total fall enrollment in

degree-granting postsecondary institutions, by level and control of institution and

race/ethnicity of student: Selected years, 1976 through 2014. Retrieved from

https://nces.ed.gov/programs/digest/d15/tables/dt15_306.20.asp?current=yes)

National Hispanic University (n.d.). NHU officially closed following 2014-2015 academic year.

Retrieved from <https://www.nhu.edu/>

Nelson Laird, T. F., Bridges, B. K., Morelon-Quainoo, C. L., Williams, J. M., & Holmes, M. S.

(2007). African American and Hispanic student engagement at minority serving and predominantly White institutions. *Journal of College Student Development*, 48(1), 39-56.

Retrieved from <http://muse.jhu.edu>

Nora, A. (2002). The depiction of significant others in Tinto's "Rites of Passage": A

reconceptualization of the influence of family and community in the persistence process.

Journal of College Student Retention: Research, Theory & Practice, 3(1), 41-56.

Retrieved from <http://csr.sagepub.com/content/3/1/41.short>

- Nunez, A., & Elizondo, D., (2012). Hispanic-serving institutions in the U.S. mainland and Puerto Rico: Organizational characteristics, institutional financial context, and graduation outcomes. A white paper for HACU. *Hispanic Association of Colleges and Universities*. Retrieved from <http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED537723>
- Nunez, A., Ramalho, E. M., & Cuero, K. K. (2010). Pedagogy for equity: Teaching in a Hispanic-serving institution. *Innovative Higher Education*, 35(3), 177-190. doi:10.1007/s10755-010-9139-7
- Nunez, A., Sparks, P. J., & Hernandez, E. A. (2011). Latina/o access to community colleges and Hispanic-serving institutions: A national study. *Journal of Hispanic Higher Education*, 10(1), 18-40. Retrieved from https://www.researchgate.net/profile/Anne_Marie_Nunez/publication/254115048_Latina/o_Access_to_Community_Colleges_and_Hispanic-Serving_Institutions_A_National_Study/links/560573d308ae5e8e3f325544.pdf
- Ortega, N., Frye, J., Nellum, C. J., Kamimura, A., & Vidal-Rodriguez, A. (2015). Examining the financial resilience of Hispanic-serving institutions. In A. M. Nunez, S. Hurtado, E. Calderon Galdeano (Eds.), *Hispanic-serving institutions: Advancing research and transformative practice* (155-176). New York, NY: Routledge.
- Oseguera, L. (2005). Four and six-year baccalaureate degree completion by institutional characteristics and racial/ethnic groups. *Journal of College Student Retention: Research, Theory & Practice*, 7(1), 19-59. Retrieved from <http://csr.sagepub.com/content/7/1/19.short>

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research*. San Francisco, CA: Jossey-Bass.

Pew Research Center (2012, March 7). The monetary value of a college education. Retrieve from <http://www.pewresearch.org/daily-number/the-monetary-value-of-a-college-education/>

Pike, G. R., Smart, J. C., Kuh, G. D., & Hayek, J. C. (2006). Educational expenditures and student engagement: When does money matter?. *Research in Higher Education*, 47(7), 847-872. Retrieved from <https://eric.ed.gov/?id=ED491028>

Reason, R. D., Terenzini, P. T., & Domingo, R. J. (2007). Developing social and personal competence in the first year of college. *Review of Higher Education*, 30(3), 271-299. Retrieved from <http://muse.jhu.edu>

Rendon, L. I. (1994). Validating culturally diverse students: Toward a new model of learning and student development. *Innovative higher education*, 19(1), 33-51. Retrieved from <http://files.eric.ed.gov/fulltext/ED371672.pdf>

retention rate. (n.d.). In *IPEDS Glossary*. Retrieved from <https://surveys.nces.ed.gov/ipeds/VisGlossaryAll.aspx>

Rodriguez, A., & Calderon Galdeano, E. (2015). Do Hispanic-serving institutions really underperform? Using propensity score matching to compare outcomes of Hispanic-serving and non-Hispanic-serving institutions. In A. M. Nunez, S., Hurtado, E., & Calderon Galdeano (Eds.), *Hispanic-serving institutions: Advancing research and transformative practice* (196-217). New York, NY: Routledge.

Ryan, J. F. (2004). The relationship between institutional expenditures and degree attainment at baccalaureate colleges. *Research in Higher Education*, 45(2), 97-114. Retrieved from http://www.oairp.org/expenditure_degree_attain.pdf

Salas, R., Aragon, A., Alandejani J., Timpson W. (2014). Mentoring experiences and Latina/o university student persistence. *Journal of Hispanic Higher Education* [serial online]. October 1, 2014;13 (4):231-244. Retrieved from <http://jhh.sagepub.com/content/13/4/231.short>

Santiago, D. A. (2010). Emerging Hispanic-serving institutions (HSIs): Serving Latina/o students. Retrieved from <http://www.edexcelencia.org/hsi-cp2/research/emerging-Hispanic-serving-institutions-hsis-serving-Latina/o-students>

Santiago, D. A. (2012). Public policy and Hispanic-serving institutions: From invention to accountability. *Journal of Latina/os & Education*, 11(3), 163-167.
doi:10.1080/15348431.2012.686367

Santiago, D. A., Calderon-Galdeano, E. (2014). Latina/o college completion: United States. Retrieved from <http://www.edexcelencia.org/research/college-completion/united-states>

Santiago, D., Taylor, M., Calderon Galdeano, E. (May 2016). From capacity to success: HSIs, Title V, and Latina/o students. Washington, D.C.: Excelencia in Education. Retrieved from <http://www.edexcelencia.org/research/capacity>

Santiago, D. A., Galdeano, M. C., & Taylor, M. (2015). Factbook 2015: The condition of Latinos in education. *Washington, DC: Excelencia in Education*. Retrieved from <http://www.edexcelencia.org/research/2015-factbook>.

- Santos, J. L., & Saenz, V. B. (2014). In the eye of the perfect storm: The convergence of policy and Latina/o trends in access and financial concerns, 1975-2008. *Educational Policy*, 28(3), 393-424. doi: 10.1177/0895904812465111
- Santos, S. J., & Reigadas, E. T. (2002). Latina/os in higher education: An evaluation of a university faculty mentoring program. *Journal of Hispanic Higher Education*, 1(1), 40-50. Retrieved from <http://jhh.sagepub.com/content/1/1/40.short>
- Savery, J. R. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-based Learning*, 1(1), 3. Retrieved from http://docs.lib.purdue.edu/ijpbl/vol1/iss1/3/&scisig=AAGBfm1tCI5G9_tUVcKwmyU6DaO4OizBRw
- Scott, M., Bailey, T., & Kienzl, G. (2006). Relative success? Determinants of college graduation rates in public and private colleges in the US. *Research in Higher Education*, 47(3), 249-279. Retrieved from <http://link.springer.com/journal/11162>
- Soper, D. S. (2016). Free statistics calculators: A-priori sample size calculator for multiple regression [Software]. Retrieved from <http://www.danielsoper.com/statcalc>
- Sparks, D., & Malkus, N. (2013). First-year undergraduate remedial course taking: 1999-2000, 2003-04, 2007-08. Statistics in Brief. NCES 2013-013. National Center for Education Statistics. Retrieved from <http://eric.ed.gov/?id=ED538339>
- Stake, R. E. (2004). *Standards-based and responsive evaluations*. Thousand Oaks, CA: Sage.
- student services (n.d.) In *IPEDS glossary*. Retrieved from <https://surveys.nces.ed.gov/ipeds/VisGlossaryAll.aspx>

- Tinto, V. (1993). *What matters in College?: Four critical years revisited*. San Francisco, CA: Jossey-Bass.
- Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. *Journal of Higher Education*, 68(6), 599-623. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/00221546.1997.11779003?journalCode=uh> ej20
- Tinto, V. (2006). Research and practice of student retention: what next? *Journal of College Student Retention: Research, Theory & Practice*, 8(1), 1-19. Retrieved from <http://csr.sagepub.com/content/8/1/1.short>
- Tinto, V. (2010). From theory to action: Exploring the institutional conditions for student retention. J. C, Smart (Ed.) in *Higher education: Handbook of theory and research*. Volume 25 (pp. 51-89). Springer Netherlands. Retrieved from http://link.springer.com/chapter/10.1007%2F978-90-481-8598-6_2
- Tinto, V. (2012). *Completing college: Rethinking institutional action*. Chicago, IL: University of Chicago Press.
- Titus, M. A. (2004). An examination of the influence of institutional context on student persistence at 4-year colleges and universities: A multilevel approach. *Research in Higher Education*, 45(7), 673-699. Retrieved from <http://link.springer.com/journal/11162>
- Titus, M. A. (2006). Understanding college degree completion of students with low socioeconomic status: The influence of the institutional financial context. *Research in Higher Education*, 47(4), 371-398. doi: 10.1007/s11162-005-9000-5

- Toews, M. L., & Yazedjian, A. (2009). Personal and interpersonal factors as predictors of college success among White and Hispanic students: An overview. *Journal of Education Research, 3*(4), 363-374. Retrieved from <http://www.voced.edu.au/content/ngv%3A47888>
- Torres, V., & Hernandez, E. (2010). Influence of an identified advisor/mentor on urban Latina/o students' college experience. *Journal of College Student Retention: Research, Theory & Practice, 11*(1), 141-160. Retrieved from <http://baywood.metapress.com>.
- Torres, V., & Zerquera, D. (2012). Hispanic-serving institutions: Patterns, predictions, and implications for informing policy discussions. *Journal of Hispanic Higher Education, 11*(3), 259-278. Retrieved from <http://jhh.sagepub.com/>
- United States Department of Education [USDE] (2016). Application package to request designation as an eligible institution under the following Title III and Title V programs. Retrieved from <https://www2.ed.gov/about/offices/list/ope/idades/eligibility.html>
- United States Department of Education [USDE] (n.d.). Developing Hispanic-serving institutions program - Title V. Retrieved from <http://www2.ed.gov/programs/idadeshsi/index.html>
- Vaquera, G., & Maestas, R. (2009). Pre-college factors impacting persistence at a diverse university. *Journal of College Student Retention: Research, Theory & Practice, 10*(4), 425-445. Retrieved from <http://baywood.metapress.com>
- Vega, A., & Martinez, R. (2012). A Latina/o scorecard for higher education a focus on Texas universities. *Journal of Hispanic Higher Education, 11*(1), 41-54. Retrieved from <http://dx.doi.org.www.libproxy.wvu.edu/10.1177/1538192711435554>

Villarreal, R. C., & Santiago, D. A. (2012). From capacity to success: HSIs and Latina/o student success through Title V. *Excelencia in Education (NJI)*. Retrieved from <https://eric.ed.gov/?id=ED538673>

Webber, D. A., & Ehrenberg, R. G. (2010). Do expenditures other than instructional expenditures affect graduation and persistence rates in American higher education? *Economics of Education Review*, 29(6), 947-958. Retrieved from <http://www.journals.elsevier.com/economics-of-education-review>

Tables

Table 1

Variables, Variable Type, Variable Label, Calculated, and Source

Variable	Variable Type	Label	Calcul.	Source
Six years average dollar amount expenditures per FTE in instruction	I	instruction	Y	DCP
Percent of expenditures per FTE in instruction	I	instruction_pct	Y	
Six years average dollar amount expenditures per FTE in academic support	I	acadsupp	Y	DCP
Percent of expenditures per FTE in academic support	I	acadsupp_pct	Y	
Six year average dollar amount expenditures per FTE in student services	I	studserv	Y	DCP
Percent of expenditures per FTE in student services	I	studserv_pct	Y	
HSI grantee	I	grantee	N	USDE
Retention rates (control)	I	retention	N	IPEDS
Percent of students admitted in fall 2007 (control)	I	F07pctAdmit	N	IPEDS
Percent of undergraduate Latina/o students fall 2007 (control)	I	F07pctULatina/o	N	IPEDS
Graduation Rates-Latina/o students from 2007 fall cohort	D	GRLatina/o	N	IPEDS
Percent bachelor's degrees awarded to Latina/os, AY2012/13	D	pctBALatina/o	N	IPEDS

Table 1 continued

Variable	Variable Type	Label	Calcul.	Source
Log Transformed Percent bachelor's degrees awarded to Latina/os, AY2012/13	D	pctBALatina/o_ln	Y	IPEDS

Note: The average expenditures were calculated per FTE for 6-year period to complete a bachelor's degree. The HSI grantee were institutions that received Title V grant funds during the 1999 to 2012 period as per Department of Education. Retention rates (year one to year two) refers to the percentage of students in the 2007 cohort that reenrolled at the same institution the following fall 2008. The percent of students admitted in fall 2007 is a control variable, proxy for selectivity. Graduation rates is the percentage of Latina/o students from the fall 2007 cohort that graduated in the same institution 6 years later. Log transformed outcome variable was performed due to positive skewness and kurtosis, and to address slight heteroscedasticity. Variable type I stands for independent variables and D for dependent or outcome variables. Sources of data were Delta Cost Project (DCP), U.S. Department of Education (USDE), and the Integrated Postsecondary Education Data System (IPEDS).

Table 2

Descriptive Statistics for Outcome and Predictor Variables

	N	Mean	SD	Min.	Max.	Skew.	Std. Error	Kurt.	Std. Error
GRLatina/o	72	41.47	14.20	15	70	0.00	0.28	-0.58	0.56
pctBALatina/o	75	37.32	17.30	16	94	1.60	0.28	2.37	0.55
pctBALatina/o_ln	75	3.53	.40	2.78	4.55	.65	0.28	0.03	0.55
instruction	75	7062.79	1859.92	2680	12675	0.91	0.28	1.27	0.55
instruction_pct	75	64.83	7.52	50	80.81	0.26	0.28	-0.52	0.55
acadsupp	75	1858.05	736.64	428	3973	0.55	0.28	-0.07	0.55
acadsupp_pct	75	17.04	5.54	5.73	34.28	0.48	0.28	0.30	0.55
studserv	75	2049.21	1127.84	484	5285	1.02	0.28	0.31	0.55
studserv_pct	75	18.13	7.04	4.78	34.70	0.52	0.28	-0.29	0.55
retention	75	69.47	10.86	43	95	-0.41	0.28	-0.08	0.55
F07pctAdmit	75	72.12	20.52	14	100	-0.37	0.28	-0.38	0.55
F07pctULatina/o	75	35.53	18.34	16	92	1.51	0.28	1.83	0.55
Grantee*									

*Note: Grantee is a dichotomous variable, 0 = non-grantee, n= 28; 1 = grantee, n= 47

Table 3

Descriptive Statistics by Title V HSI Grantee

	Grantee (N=47)			Non-Grantee (N=28)		
	N	Mean	SD	N	Mean	SD
GRLatina/o	46	38.50	13.42	26	46.73	14.27
pctBALatina/o	47	42.51	17.44	28	28.62	13.32
pctBALatina/o_in	47	3.68	.37	28	3.29	.32
instruction	47	6929.38	1727.77	28	7286.71	2076.57
instruction_pct	47	65.35	7.38	28	63.95	7.82
acadsupp	47	1888.04	680.05	28	1807.71	833.76
acadsupp_pct	47	17.76	5.14	28	15.83	6.06
studserv	47	1872.70	1077.30	28	2345.50	1167.81
studserv_pct	47	16.88	6.13	28	20.22	8.05
retention	47	67.79	11.95	28	72.29	8.16
F07pctULatina/o	47	41.79	17.99	28	25.04	13.70
F07pctAdmit	47	71.96	20.80	28	72.39	20.41

Table 4

Pearson Correlation for Graduation Rates, Dollar Amount Expenditures, Grantee, and Control Variables

	N	1	2	3	4	5	6	7
1 GRLatino								
2 instruction	72	.34**						
3 acadsupp	72	.46**	.40**					
4 retention	72	.78**	.36**	.39**				
5 F07pctAdmit	72	-.26*	-.23*	-.21*	-.30*			
6 F07pctULatino	72	-.23*	-.17	.05	-.24*	0.1		
7 studserv	72	.47**	.40**	.32**	.27*	-0.19	-.25*	
8 Grantee	72	-.28*	-.10	.06	-.20*	0.03	.45**	-.24*

** . Correlation is significant at the 0.01 level.

* . Correlation is significant at the 0.05 level.

Table 5

Pearson Correlation for Graduation Rates, Percent Expenditures, Grantee, and Control Variables

		N	1	2	3	4	5	6	7
1	GRLatino	72	1						
2	instruction_pct	72	-.37*						
3	acadsupp_pct	72	.15	-.46**					
4	retention	72	.78**	-.14	.11				
5	F07pctAdmit	72	-.26*	.12	-.05	-.30*			
6	F07pctULatino	72	-.23*	.09	.22*	-.24*	.10		
7	studserv_pct	72	.29*	-.72**	-.28*	.06	-.09	-.27*	
8	Grantee	72	-.28*	.10	.20*	-.20*	.03	.45**	-.27*

Note. **. Correlation is significant at the 0.01 level. *. Correlation is significant at the 0.05 level.

Multicollinearity was a concern due to the high correlation between two predictors (instruction_pct and studserv_pct). There was presence of suppression because the correlation between instruction_pct and GRLatino, $r = -.37$, was less than the product between the correlation between studserv_pct and GRLatino, $r = .29$, and the correlation between studserv_pct and instruction_pct, $r = -.72$, resulted in a value $(-.21)$ higher than $-.37$. Consequently, the instruction_pct predictor was removed from the hierarchical multiple regression analyses.

Table 6

Pearson Correlation for Percent Bachelor's Degrees Awarded to Latinos, Dollar Amount Expenditures per FTE, Grantee, and Control Variables

	N	1	2	3	4	5	6	7
1 pctBALatino	75							
2 instruction	75	-.17						
3 acadsupp	75	.03	.39**					
4 retention	75	-.12	.34**	.30**				
5 F07pctAdmit	75	.02	-.22*	-.15	-.33*			
6 F07pctULatino	75	.98**	-.17	.00	-.18	.04		
7 studserv	75	-.21*	.40**	.30*	.26*	-.21*	-.22*	
8 Grantee	75	.39**	-.09	.05	-.20*	-.01	.44**	.20*

** . Correlation is significant at the 0.01 level.

* . Correlation is significant at the 0.05 level.

Table 7

Pearson Correlation for Percent Bachelor's Degrees Awarded to Latinos, Percentage Expenditures per FTE, Grantee, and Control Variables

	N	1	2	3	4	5	6	7
1 pctBALatino	75							
2 instruction_pct	75	.06						
3 acadsupp_pct	75	.19*	-.45*					
4 retention	75	-.12	-.11	.05				
5 F07pctAdmit	75	.02	.11	.02	-.33**			
6 F07pctULatino	75	.98**	.10	.16	-.18	.04		
7 studserv_pct	75	-.22*	-.71**	-.30**	.08	-.13	-.23*	
8 Grantee	75	.39**	.09	.17	-.20*	-.01	.44**	-.23*

** . Correlation is significant at the 0.01 level.

* . Correlation is significant at the 0.05 level.

Table 8

Pearson Correlation for Transformed Percent Bachelor's Degrees Awarded to Latinos, Dollar Amount Expenditures per FTE, Grantee, and Control Variables

	N	1	2	3	4	5	6
1 pctBALatino_ln	75	1					
2 instruction	75	-.13					
3 acadsupp	75	.06	.39**				
4 retention	75	.09	.34**	.30**			
5 F07pctAdmit	75	-.01	-.22*	-.15	-.33**		
6 studserv	75	-.23*	.40**	.30*	.26*	-.21*	
7 Grantee	75	.47**	-.09	.05	-.20*	-.01	-.20*

** . Correlation is significant at the 0.01 level.

* . Correlation is significant at the 0.05 level.

Table 9

Pearson Correlation for Transformed Percent Bachelor's Degrees Awarded to Latinos, Percentage of Expenditures per FTE, Grantee, and Control Variables

	N	1	2	3	4	5	6
1 pctBALatino_ln	75						
2 Instruction_pct	75	.09					
3 Acadsupp_pct	75	.20*	-.45**				
4 retention	75	-.09	-.11	.05			
5 F07pctAdmit	75	-.01	.11	.02	-.33**		
6 Studserv_pct	75	-.26*	-.71**	-.30**	.08	-.13	
7 Grantee	75	.47**	.09	.17*	-.20*	-.01	-.23*

** . Correlation is significant at the 0.01 level.

* . Correlation is significant at the 0.05 level.

Table 10

HMR for Dependent Variable: GRLatino, with instruction_pct Variable Removed to Explore Multicollinearity Concerns and Suppression Effect

		Unstd. Coefficient		Std. Coefficient	Sig	95% CI for B	
		B	Std. Error	Beta		Lower Bound	Upper Bound
Step 1							
	(Constant)	-28.10	10.34		0.01	-48.73	-7.47
	acadsupp_pct	0.19	0.20	0.08	0.34	-0.21	0.60
	retention	1.00	0.11	0.75	0.00	0.78	1.22
	F07pctAdmit	-0.02	0.06	-0.03	0.70	-0.13	0.09
	F07pctULatino	-0.05	0.06	-0.07	0.40	-0.18	0.07
Step 2							
	(Constant)	-40.82	10.47		0.00	-61.72	-19.91
	acadsupp_pct	0.39	0.19	0.15	0.04	0.01	0.78
	retention	0.97	0.10	0.73	0.00	0.77	1.18
	F07pctAdmit	-0.01	0.05	-0.01	0.85	-0.11	0.09
	F07pctULatino	0.02	0.06	0.03	0.76	-0.10	0.14
	studserv_pct	0.53	0.15	0.26	0.00	0.23	0.83
	Grantee	-3.04	2.33	-0.10	0.20	-7.70	1.62

Note: Dependent Variable: GRLatino. Instruction_pct variable removed from analysis. The percent of expenditures in academic support became significant in the second model when student services and grantee were entered into the model. The final model showed that acadsupp_pct and studserv_pct were significant and positive predictors of Latinas/os graduation rates. Retention was a significant and positive predictor of graduation in both models. When percentage of expenditures in student services and grantee were included in the second model, there was a 7.5% change from model one ($R^2 = .62$, $p < .001$) to model two ($R^2 = .69$, $p < .05$). This result suggested that percentage of expenditures in student services predictor was a significant contributor to the 7.5% of the variation in graduation rates of Latinas/os because it made also acadsupp_pct predictor significant, and reduced retention coefficients.

Table 11

HMR for Dependent Variable: GRLatino, with studserv_pct Variable Removed

		Unstd. Coefficient		Std. Coefficient	Sig	95% CI for B	
		B	Std. Error	Beta		Lower Bound	Upper Bound
Step 1							
	(Constant)	12.17	14.38		0.40	-16.54	40.89
	instruction_pct	-0.56	0.15	-0.30	0.00	-0.85	-0.26
	acadsupp_pct	-0.19	0.21	-0.07	0.38	-0.61	0.24
	retention	0.99	0.10	0.74	0.00	0.79	1.19
	F07pctAdmit	-0.01	0.05	-0.01	0.91	-0.11	0.10
	F07pctULatino	-0.01	0.06	-0.01	0.87	-0.13	0.11
Step 2							
	(Constant)	11.82	14.31		0.41	-16.75	40.40
	instruction_pct	-0.53	0.15	-0.28	0.00	-0.83	-0.23
	acadsupp_pct	-0.13	0.22	-0.05	0.54	-0.56	0.30
	retention	0.97	0.10	0.73	0.00	0.77	1.18
	F07pctAdmit	-0.01	0.05	-0.01	0.85	-0.11	0.09
	F07pctULatino	0.02	0.06	0.03	0.76	-0.10	0.14
	Grantee	-3.04	2.33	-0.10	0.20	-7.70	1.62

Note: Dependent Variable: GRLatino. Studserv_pct removed from analysis. Instruction_pct variable has a negative association with outcome variable when the studserv_pct variable was removed.

Percentage of expenditures in instruction and retention were significant predictors of Latinas/os graduation rates in both models. Retention was a positive predictor of graduation rates of Latinas/os, while the percentage of expenditures in instruction predictor had a negative relationship to the graduation rates of Latinas/os. There was very little variance (R^2 change = .008) change from model one ($R^2 = .68$, $p < .001$) to model two ($R^2 = .69$, $p = .197$), which suggested that grantee predictor did not significantly contribute to variance in graduation rates of Latinas/os.

Table 12

HMR for Dependent Variable: pctBALatino, with instruction_pct Variable Removed

		Unstd. Coefficient		Std. Coefficient	Sig	95% CI for B	
		B	Std. Error	Beta		Lower Bound	Upper Bound
Step 1							
	(Constant)	-2.76	4.09		0.50	-10.92	5.40
	acadsupp_pct	0.08	0.08	0.03	0.30	-0.08	0.24
	retention	0.09	0.04	0.06	0.04	0.00	0.17
	F07pctAdmit	0.00	0.02	-0.01	0.82	-0.05	0.04
	F07pctULatino	0.93	0.02	0.98	0.00	0.88	0.98
Step 2							
	(Constant)	-2.16	4.54		0.64	-11.22	6.90
	acadsupp_pct	0.11	0.08	0.03	0.19	-0.05	0.27
	retention	0.07	0.04	0.05	0.08	-0.01	0.16
	F07pctAdmit	-0.01	0.02	-0.01	0.74	-0.05	0.04
	F07pctULatino	0.95	0.03	1.00	0.00	0.90	1.00
	studserv_pct	0.02	0.07	0.01	0.71	-0.11	0.15
	Grantee	-1.78	1.00	-0.05	0.08	-3.77	0.20

Note: Dependent Variable: pctBALatino. Instruction_pct variable removed from analysis.

Retention was a significant and positive predictor of percentage of bachelor's degrees awarded to Latinas/os only in first model. The percent of undergraduate Latina/os students enrolled in fall 2007 was significant and positive predictor of percentage of bachelor's degrees awarded to Latinas/os in both models. There was little variance (.002) change from model one ($R^2 = .957$, $p < .001$) to model two ($R^2 = .96$, $p = .176$). This result suggested that student services expenditures predictor and grantee did not significantly contribute to the variation in the percentage of bachelor's degrees awarded to Latinas/os.

Table 13

HMR for Dependent Variable: pctBALatino, with studserv_pct Variable Removed

		Unstd. Coefficient		Std. Coefficient	Sig	95% CI for B	
		B	Std. Error	Beta		Lower Bound	Upper Bound
Step 1							
	(Constant)	0.04	6.25		0.99	-12.43	12.51
	instruction_pct	-0.04	0.07	-0.02	0.55	-0.17	0.09
	acadsupp_pct	0.06	0.09	0.02	0.54	-0.12	0.23
	retention	0.09	0.04	0.05	0.04	0.00	0.17
	F07pctAdmit	0.00	0.02	0.00	0.88	-0.05	0.04
	F07pctULatino	0.93	0.02	0.99	0.00	0.88	0.98
Step 2							
	(Constant)	0.29	6.16		0.96	-12.00	12.57
	instruction_pct	-0.02	0.07	-0.01	0.71	-0.15	0.11
	acadsupp_pct	0.08	0.09	0.03	0.36	-0.10	0.26
	retention	0.07	0.04	0.05	0.08	-0.01	0.16
	F07pctAdmit	-0.01	0.02	-0.01	0.74	-0.05	0.04
	F07pctULatino	0.95	0.03	1.00	0.00	0.90	1.00
	Grantee	-1.78	1.00	-0.05	0.08	-3.77	0.20

Note: Dependent Variable: pctBALatino. Studserv_pct predictor removed from analysis. Percentage of undergraduate Latinas/os enrolled in 2007 fall and retention were the only significant predictors of the percentage of bachelor's degrees awarded to Latinas/os in model one. Only the percentage of undergraduate Latinas/os enrolled in 2007 fall remained a significant predictor. There was very little R square change (.002) from model one ($R^2 = .958$, $p < .001$) to model two ($R^2 = .96$, $p = .078$), which suggested that grantee predictor did not significantly contribute to the variance of the percentage of bachelor's degrees awarded to Latinas/os.

Table 14

HMR for Dependent Variable: pctBALatino_In, with instruction_pct Variable Removed

		Unstd. Coefficient		Std. Coefficient	Sig	95% CI for B	
		B	Std. Error	Beta		Lower Bound	Upper Bound
Step 1							
	(Constant)	3.64	0.42		0.00	2.80	4.49
	acadsupp_pct	0.02	0.01	0.21	0.07	0.00	0.03
	retention	0.00	0.00	-0.12	0.35	-0.01	0.00
	F07pctAdmit	0.00	0.00	-0.05	0.66	-0.01	0.00
Step 2							
	(Constant)	3.40	0.44		0.00	2.53	4.28
	acadsupp_pct	0.01	0.01	0.09	0.41	-0.01	0.02
	retention	0.00	0.00	-0.01	0.96	-0.01	0.01
	F07pctAdmit	0.00	0.00	-0.03	0.79	0.00	0.00
	studserv_pct	-0.01	0.01	-0.14	0.23	-0.02	0.01
	Grantee	0.34	0.09	0.42	0.00	0.16	0.53

Note: Dependent Variable: pctBALatino_In. Instruction_pct variable removed from analysis. Only grantee was a significant and positive predictor of percentage of bachelor's degrees awarded to Latinas/os. When grantee was included in the model, there was a 19.5% change from model one ($R^2 = .05$, $p = .27$) to model two ($R^2 = .25$, $p < .001$). This result suggested that the grantee predictor accounted for 19.5% of the variation in graduation rates of Latinas/os, and that the percentage of expenditures in student services did not significantly contribute to the variance in the final model. The percent of expenditures in student services predictor was not a significant contributor to the variance of the outcome variable when the control variable (F07pctULatino) representing the percent of undergraduate Latinas/os enrolled on fall 2007 was removed from the analysis and the outcome variable was transformed ($\log_e$).

Table 15

HMR for Dependent Variable: pctBALatino_In, with studserv_pct Variable Removed

		Unstd. Coefficient		Std. Coefficient	Sig	95% CI for B	
		B	Std. Error	Beta		Lower Bound	Upper Bound
Step 1							
	(Constant)	2.72	0.67		0.00	1.40	4.05
	instruction_pct	0.01	0.01	0.23	0.08	0.00	0.03
	acadsupp_pct	0.02	0.01	0.31	0.02	0.00	0.04
	retention	0.00	0.00	-0.10	0.40	-0.01	0.01
	F07pctAdmit	0.00	0.00	-0.08	0.53	-0.01	0.00
Step 2							
	(Constant)	2.63	0.61		0.00	1.41	3.85
	instruction_pct	0.01	0.01	0.14	0.23	-0.01	0.02
	acadsupp_pct	0.01	0.01	0.20	0.11	0.00	0.03
	retention	0.00	0.00	-0.01	0.96	-0.01	0.01
	F07pctAdmit	0.00	0.00	-0.03	0.79	0.00	0.00
	Grantee	0.34	0.09	0.42	0.00	0.16	0.53

Note: Dependent Variable: pctBALatino_In. Studserv_pct removed from analysis. In step one, only percentage of expenditures in academic support was a significant and positive predictor of the percent of bachelor's degrees awarded to Latinas/os, but it was not significant in the final model. In the final model, only grantee was a significant and positive predictor of the percent of bachelor's degrees awarded to Latinas/os. There was a 15.4% R square change from step 1 ($R^2 = .09$, $p = .134$) to step 2 ($R^2 = .25$, $p < .001$), which suggested that the grantee predictor explained a considerable amount of variation in the percent of bachelor's degrees awarded to Latinas/os. The percent of expenditures in instruction predictor was not a significant contributor to the variance of the outcome variable when the control variable (F07pctULatino) representing the percent of undergraduate Latinas/os enrolled on fall 2007 was removed from the analysis and the outcome variable was transformed ($\log_e$).

Table 16

Q1. Hierarchical Multiple Regression Analyses Predicting Graduation Rates from Dollar Amount Expenditures, Title V Grantee, and Control Variables

	B	SE B	β	p
Step 1				
Constant	-26.30 (-46.80, -5.80)	10.27		.01
instruction	-0.00 (0.00, 0.00)	0.00	-.01	.92
acadsupp	0.00 (0.00, 0.01)	0.00	.20	.02
retention	0.91 (0.68, 1.14)	0.12	.68	.00
F07pctAdmit	-0.01 (-0.12, 0.10)	0.05	-.01	.89
F07pctULatina/o	-0.06 (-0.18, 0.06)	0.06	-.08	.30
Step 2				
Constant	-26.64 (-45.85, -7.44)	9.61		.01
instruction	-0.00 (0.00, 0.00)	0.00	-.08	.32
acadsupp	0.00 (0.00, 0.01)	0.00	.16	.05
retention	0.88 (0.67, 1.10)	0.11	.66	.00
F07pctAdmit	0.00 (-0.10, 0.10)	0.05	-.00	.99
F07pctULatina/o	0.01 (-0.11, 0.13)	0.06	.02	.83
studserv	0.00 (0.00, 0.01)	0.00	.25	.00
Grantee	-3.30 (-7.83, 1.23)	2.27	-.11	.15

Note: Dependent Variable: GRLatina/o. N= 72. $R^2 = .71$, $p < .001$ for Step 2 final model

Table 17

Q2. Hierarchical Multiple Regression Analyses Predicting Graduation Rates from Percent Expenditures, Title V Grantee, and Control Variables

	B	SE B	β	p
Step 1				
Constant	-28.10 (-48.73, -7.47)	10.34		.01
Acadsupp_pct	-0.19 (-0.21, 0.60)	0.20	.08	.34
retention	1.00 (0.78, 1.22)	0.11	.75	.00
F07pctAdmit	-0.02 (-0.13, 0.09)	0.06	-.03	.70
F07pctULatina/o	-0.05 (-0.18, 0.07)	0.06	-.07	.40
Step 2				
Constant	-40.82 (-61.72, -19.91)	10.47		.00
Acadsupp_pct	0.39 (0.01, 0.78)	0.19	.15	.04
retention	0.97 (0.77, 1.18)	0.10	.73	.00
F07pctAdmit	-0.01 (-0.11, 0.09)	0.05	-.01	.85
F07pctULatina/o	0.02 (-0.1, 0.14)	0.06	.03	.76
Studserv_pct	0.53 (0.23, 0.83)	0.15	.26	.00
Grantee	-3.04 (-7.70, 1.62)	2.33	-.10	.20

Note: Dependent Variable: GRLatina/o. N= 72. $R^2 = .69$, $p < .001$ for final model. Due to the high correlation between studserv_pct and instruction_pct predictors and that instruction_pct predictor had a suppression effect, the latter was removed from the analysis. There was a 7.5% R square change from step 1 ($R^2 = .62$, $p = .134$) which suggested that entering studserv_pct and grantee predictors also made acadsupp_pct predictors significant in the final model. Retention was consistently significant and positive predictor of graduation rates of Latinas/os in both model, and had the largest effect size ($\beta = .73$).

Table 18

Q3. Hierarchical Multiple Regression Analyses Predicting Percent of Bachelor's Degrees Awarded to Latina/os from Dollar Amount Expenditures, Title V Grantee, and Control Variables

	B	SE B	β	p
Step 1				
(Constant)	-0.33 (-8.70, 8.04)	4.19		.94
instruction	0.00 (0.00, 0.00)	0.00	-.04	.17
acadsupp	0.00 (0.00, 0.00)	0.00	.02	.47
retention	0.10 (0.01, 0.19)	0.04	.06	.03
F07pctAdmit	-0.01 (-0.05, 0.04)	0.02	-.01	.74
F07pctULatina/o	0.93 (0.88, 0.97)	0.02	.98	.00
Step 2				
(Constant)	1.23 (-7.28, 9.73)	4.26		.77
instruction	0.00 (0.00, 0.00)	0.00	-.04	-.19
acadsupp	0.00 (0.00, 0.00)	0.00	.03	.35
retention	0.09 (0.00, 0.18)	0.05	.05	.06
F07pctAdmit	-0.01 (-0.06, 0.03)	0.02	-.01	.62
F07pctULatina/o	0.94 (0.89, 1.00)	0.03	1	.00
studserv	0.00 (0.00, 0.00)	0.00	-.01	.80
Grantee	-1.78 (-3.77, 0.21)	1.00	-.05	.08

Note: Dependent Variable: pctBALatina/o. N= 75. $R^2 = .96$, $p < .001$ for Model 1

Table 19

Q3.1. Hierarchical Multiple Regression Analyses Predicting Log Transformed Percent of Bachelor's Degrees Awarded to Latina/os from Dollar Amount Expenditures, Title V Grantee, and F07pctULatina/o Control Variable Removed

	B	SE B	β	p
Step 1				
(Constant)	3.96 (3.10, 4.82)	0.43		.00
instruction	-0.00 (0.00, 0.00)	0.00	-.16	.22
acadsupp	0.00 (0.00, 0.00)	0.00	.14	.28
retention	-0.00 (-0.01, 0.01)	0.00	-.09	.48
F07pctAdmit	-0.00 (-0.01, 0.01)	0.00	-.06	.64
Step 2				
(Constant)	3.43 (2.61, 4.25)	0.41		.00
instruction	-0.00 (0.00, 0.00)	0.00	-.08	.52
acadsupp	0.00 (0.00, 0.00)	0.00	.10	.40
retention	0.00 (-0.01, 0.01)	0.00	.02	.84
F07pctAdmit	-0.00 (-0.01, 0.00)	0.00	-.04	.76
studserv	-0.00 (0.00, 0.00)	0.00	-.15	.21
Grantee	0.35 (0.17, 0.53)	0.09	.43	.00

Note: Dependent Variable: pctBALatina/o_ln. N= 75. $R^2 = .25$, $p < .001$ for Model 2

Table 20

Q4. Hierarchical Multiple Regression Analyses Predicting Percent of Bachelor's Degrees Awarded to Latina/os from Percent Expenditures, Title V Grantee, and Control Variables

	B	SE B	β	p
Step 1				
(Constant)	-2.76 (-10.92, 5.39)	4.09		.50
acadsupp_pct	0.08 (-0.08, 0.24)	0.08	.03	.30
retention	0.09 (0.00, 0.17)	0.04	.06	.04
F07pctAdmit	-0.01 (-0.05, 0.04)	0.02	-.01	.83
F07pctULatina/o	0.93 (0.88, 0.98)	0.02	.98	.00
Step 2				
(Constant)	-2.16 (-11.22, 6.89)	4.54		.64
acadsupp_pct	0.08 (-0.05, 0.27)	0.08	.03	.19
retention	0.07 (-0.01, 0.16)	0.04	.05	.09
F07pctAdmit	-0.01 (-0.05, 0.04)	0.02	-.01	.74
F07pctULatina/o	0.95 (0.90, 1.00)	0.03	1.00	.00
Studserv_pct	.02 (-0.11, 0.16)	0.07	.01	.71
Grantee	-1.78 (-3.77, 0.21)	.99	-.05	.08

Note: Dependent Variable: pctBALatina/o. N= 75. $R^2 = .96$, $p < .001$ for Model 1

Table 21

Q4.1. Hierarchical Multiple Regression Analyses Predicting Log Transformed Percent of Bachelor's Degrees Awarded to Latina/os from Percent Expenditures, Title V Grantee, and F07pctULatina/o Control Variable Removed

	B	SE B	β	p
Step 1				
(Constant)	2.72 (1.40, 4.05)	0.67		.00
Instruction_pct	0.01 (0.00, 0.03)	0.01	.23	.08
Acadsupp_pct	0.02 (0.00, 0.04)	0.01	.31	.02
retention	- 0.00 (-0.01, 0.01)	0.00	-.10	.40
F07pctAdmit	- 0.00 (-0.01, 0.00)	0.00	-.08	.53
Step 2				
(Constant)	2.63 (1.41, 3.85)	0.61		.00
Instruction_pct	0.01 (-0.01, 0.02)	0.01	.14	.23
Acadsupp_pct	0.01 (0.00, 0.03)	0.01	.20	.11
retention	0.00 (-0.01, 0.01)	0.00	-.01	.96
F07pctAdmit	- 0.00 (0.00, 0.00)	0.00	-.03	.79
Grantee	0.34 (0.16, 0.53)	0.09	.42	.00

Note: Dependent Variable: pctBALatina/o_ln. N= 75. $R^2 = .25$, $p < .001$ for Model 2

Table 22

Equity Index of Bachelor's degrees Awarded to Latina/os by Title V grantee status

	Sample			Title V Grantee			Title V Non-Grantee		
	N	Mean	Equity	N	Mean	Equity	N	Mean	Equity
pctBALatina/o	75	37.32	$= 1.05$	47	42.51	$= 1.03$	28	28.62	$= 1.17$
F07pctULatina/o	75	35.53		47	41.79		28	25.04	

Figures

Figure 1. Variables examined in the literature review and new variables in this study

Appendix A

List of Hispanic Serving Institutions

unitid	Institution	State
110468	Alliant International University-San Diego	California
110361	California Baptist University	California
110529	California State Polytechnic University-Pomona	California
110486	California State University-Bakersfield	California
441937	California State University-Channel Islands	California
110547	California State University-Dominguez Hills	California
110556	California State University-Fresno	California
110565	California State University-Fullerton	California
110583	California State University-Long Beach	California
110592	California State University-Los Angeles	California
409698	California State University-Monterey Bay	California
110608	California State University-Northridge	California
110510	California State University-San Bernardino	California
366711	California State University-San Marcos	California
110495	California State University-Stanislaus	California
114813	Fresno Pacific University	California
115728	Holy Names University	California
117627	La Sierra University	California
119173	Mount Saint Mary's University	California
119605	National University	California
120184	Notre Dame de Namur University	California
123554	Saint Mary's College of California	California
122409	San Diego State University	California
110671	University of California-Riverside	California
110714	University of California-Santa Cruz	California
117140	University of La Verne	California
125763	Whittier College	California
125897	Woodbury University	California
126182	Adams State University	Colorado
128106	Colorado State University-Pueblo	Colorado
133951	Florida International University	Florida
367884	Hodges University	Florida
136215	Nova Southeastern University	Florida
137476	St Thomas University	Florida
148496	Dominican University	Illinois
147776	Northeastern Illinois University	Illinois
150172	Calumet College of Saint Joseph	Indiana
185129	New Jersey City University	New Jersey
186432	Saint Peter's University	New Jersey

unitid	Institution	State
187648	Eastern New Mexico University-Main Campus	New Mexico
187897	New Mexico Highlands University	New Mexico
187967	New Mexico Institute of Mining and Technology	New Mexico
188030	New Mexico State University-Main Campus	New Mexico
187985	University of New Mexico-Main Campus	New Mexico
188304	Western New Mexico University	New Mexico
193399	College of Mount Saint Vincent	New York
190567	CUNY City College	New York
190600	CUNY John Jay College of Criminal Justice	New York
190637	CUNY Lehman College	New York
190761	Dominican College of Blauvelt	New York
193016	Mercy College	New York
194161	Nyack College	New York
222831	Angelo State University	Texas
225399	Houston Baptist University	Texas
227331	Our Lady of the Lake University	Texas
227845	Saint Edward's University	Texas
228149	St Mary's University	Texas
228501	Sul Ross State University	Texas
226152	Texas A & M International University	Texas
224147	Texas A & M University-Corpus Christi	Texas
228705	Texas A & M University-Kingsville	Texas
228459	Texas State University	Texas
227377	The University of Texas at Brownsville	Texas
228796	The University of Texas at El Paso	Texas
229027	The University of Texas at San Antonio	Texas
229018	The University of Texas of the Permian Basin	Texas
227368	The University of Texas Rio Grande Valley	Texas
225511	University of Houston	Texas
225414	University of Houston-Clear Lake	Texas
225432	University of Houston-Downtown	Texas
225502	University of Houston-Victoria	Texas
227863	University of St Thomas	Texas
225627	University of the Incarnate Word	Texas
229780	Wayland Baptist University	Texas
235422	Heritage University	Washington

Appendix B

IRB Approval Communication

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1:27 PM

to sstack, me

IRB protocol number: [1612374589](#)

Title: Degree Attainment and Graduation Rates of Latina/os at Hispanic Serving Institutions

PI: Samuel F Stack

The West Virginia University Institutional Review Board reviewed the above-referenced protocol on 5-Dec-2016 and determined that it does not meet the definition of human subject research. To access this protocol, click on the protocol number link provided. Your correspondence concerning this action can be found in the correspondence section [HERE](#) . For more information, see the [Viewing Correspondence](#) quick reference guide. Any future protocol action requests can be completed through the WVU+kc system.

NEED HELP? The Office of Research Integrity and Compliance is here to assist you from initial submission of a protocol through approval and all subsequent actions. If you have any questions, please contact the Office of Research Integrity and Compliance at [304-293-7073](tel:304-293-7073) or email IRB@mail.wvu.edu. Thank you.

Appendix C

Examination of assumptions by inspecting histograms, normal P-P plot of regression of standardized residual of dependent variables. GRLatina/o and dollar amount expenditures per FTE in instruction, academic support, student services, retention, F07pctAdmit, F07pctULatina/o, and grantee.

Graduation Rates of Latina/os	
Dollar Amount Expenditures	Percentage of Expenditures
<p>Histogram Dependent Variable: GRLatino</p> <p>Mean = -.352E-17 Std. Dev. = 0.949 N = 72</p> <p>Normal P-P Plot of Regression Standardized Residual Dependent Variable: GRLatino</p>	<p>Histogram Dependent Variable: GRLatino</p> <p>Mean = -.03E-16 Std. Dev. = 0.957 N = 72</p> <p>Normal P-P Plot of Regression Standardized Residual Dependent Variable: GRLatino</p>

Percent of Bachelor's Degrees Awarded to Latina/os	
Dollar Amount Expenditures	Percent of Expenditures

Control variable (F07pctULatina/o) Removed and DV transformed Log e

PctBALatina/o_In and educational expenditures per FTE in instruction, academic support, student services, retention, F07pctAdmit, and grantee