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Financial aid and completion rates at diverse public, four-year, higher education institutions

Sandra Gayle Nadelson
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FINANCIAL AID AND COMPLETION RATES AT DIVERSE PUBLIC,
FOUR-YEAR, HIGHER EDUCATION INSTITUTIONS

by

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A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Philosophy Degree in Higher Education
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Doctor of Philisophy in Educational Leadership

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ABSTRACT

Financial Aid and Completion Rates at Diverse Public, Four-Year, Higher Education Institutions

by

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The main purpose of student financial aid is to improve student success. Success can be defined as improving students' access to higher education, increasing institutional choices, and increasing graduation rates (Davis, 2001). Research has focused on financial aid and student success. Financial aid has been associated with improving access for low income and minority students (Heller, 2005). However, research has not proven that all types of financial aid are effective in increasing choice and the graduation rates of these groups of students (Kerkvliet & Nowell, 2005; Kim, 2004).

Thus, the purpose of this study was to determine if financial aid improved student success by increasing the graduation rates of students attending four diverse types of higher educational institutions: Hispanic Serving Institutions (HSIs), Historically Black Colleges and Universities (HBCUs), other institutions that serve high (25% or higher) proportions of minority students (HMSIs), and Predominantly White Institutions (PWIs). In order to do this, the trends in financial aid and graduation rates were first analyzed by

the four types of institutions. Following this, statistical analyses revealed relationships between financial aid and graduation rates in these four types of institutions.

Integrated Postsecondary Education Data System (IPEDS) data from over 170 institutions were compiled for analyses. Six years of data were evaluated starting with the IPEDS data collected in 1999. Statistical processes used included ANOVA and regression analyses. The results indicated that there has been a rise in financial aid and graduation rates in all four types of institutions. However, the growth in both graduation rates and financial aid varied by institutional type. Graduation rates increased at HBCUs to a lesser degree than at HSIs, HMSIs, and PWIs. This indicated that HBCUs lost ground to these other types of institutions. Using ANOVA, significant differences were found between graduation rates at HSIs, HBCUs, HMSIs, and PWIs in 2005. Both HSIs and HBCUs had significantly lower graduation rates than did the HMSIs and PWIs during that year.

All four types of institutions experienced increases in federal grant aid, state grant aid, institutional grant aid, and loans between 1999 and 2005. HBCUs saw the greatest rise in average dollar amounts taken in loans but the lowest percentage rise in institutional grant aid awarded to students. By 2005, on average, HBCU students took on \$4000 in loans, a \$1000 increase since 1999.

When regression analyses were performed, state grant aid awarded in 1999 was a significant predictor of 2005 graduation rates at HMSIs but not at HSIs, HBCUs, or PWIs. Average institution-based grant aid provided in 1999 was a significant predictor of 2005 graduation rates for HMSIs and PWIs but not HSIs or HBCUs. No relationships were found between federal grant aid or loans and graduation rates at any or all of the

four institutional types. In other words, the dollar amounts of loans and federal aid did not increase or decrease the likelihood of graduation when data from all four institutional types were combined or when data from each of the four institutional types were analyzed independently.

The results of this study refute the premise that the amount of financial aid improves success for all low income and minority students at all institutional types through improving their graduation rates. Further research is needed in order to identify the specific factors that influence the impact of financial aid awards on student success.

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CHAPTER 1

INTRODUCTION

The United States has attributed its economic success to an educated workforce that provides innovations to world markets (Bowen, Kurzweil, & Tobin, 2005). Because education affords a variety of social, personal, and economic benefits, college educated people have been important to future national success (Pascarella & Terrenzini, 2005). To continue growing economically and socially, the United States has needed to enhance the success for all students including minority and low-income students (Castellanos & Jones, 2003). Success has been defined educationally as access to education, institutional choice, and program completion (Davis, 2001).

According to the Institute for Higher Education Policy (1998), persons who have attended higher education institutions receive higher salaries, have better benefits, and have more employment opportunities. They are typically likely to save money, and have better working conditions that contribute to a multitude of benefits that include better health and reduced healthcare costs. Even though these are advantageous outcomes, access to higher education and to the benefits of attending colleges and universities have been limited in the United States (Karen & Dougherty, 2005). Findings from recent national studies indicate that the current system has failed to provide accessible postsecondary education to many (Archibald, 2002; Wilkerson, 2005). This failure has been attributed to rising tuition costs, financial aid shortages, and the lack of funding of

higher education (Bowen et al., 2005). Because of these issues and others, it has become essential for educational spending to assist students not only in pursuing postsecondary education but also in completing a bachelors' degree program. This can only be accomplished by knowing what effect federally funded dollars have on student outcomes.

Particular groups of students have faced obstacles in successfully obtaining a postsecondary education (Karen & Dougherty, 2005). Students of Latino/a ethnicity are less likely than non-Hispanic Caucasians to graduate from high school, take advanced courses in high school, do well on the Standardized Achievement Test (SAT), and attend or graduate from college (Williams & Swail, 2005). African American students have faced similar impediments in their pursuit of higher education (Flowers, 2006).

Students from these racial/ethnic groups have had other challenges: They have been more likely to come from low-income families and have greater difficulty paying for college (McGlynn, 2006; Merisotis & McCarthy, 2005). According to Heller (2005), students from low and even middle-income families have had greater difficulty graduating due to funding issues.

Consequently, financial difficulties have caused young people to forgo college or, if they have attended, to enroll in less expensive schools or rely heavily on the use of financial aid (Heller, 2005; Wilkerson, 2005). The purpose of financial aid has been to promote student success by promoting access (Wilkerson). However, access need not be the only function of aid. Financial aid should also enhance educational choices and graduation rates to best serve financially needy students (Carter, 2006; Swail, Cabrera, Lee, & Williams, 2005).

Students who apply for aid and can demonstrate financial need are usually offered more than one type of financial aid assistance (Heller, 2005). The term *financial aid packages* refers to providing several forms of assistance, such as grants/scholarships, loans, and work-study. Grants may be based either on students' financial needs (need-based) or on their abilities (merit-based). Students are not required to pay back grants, but they are required to do so for loans (Singell & Stater, 2006).

Pell Grants are federal grants (College Board, 2006a). These financial awards are based on the economic needs of students. A higher amount awarded indicates a greater need. On average, annual student awards for those eligible to receive Pell Grants are \$2,500 with the maximum award being \$4,000 (College Board, 2006a).

Loans have been another form of aid often used by students. This type of aid can either be subsidized by the federal government or unsubsidized (Herzog, 2005). In the case of subsidized loans, the federal government pays the interest while students are enrolled in an institution of higher education. When students leave higher education, they have been responsible for paying the interest of subsidized loans. Students have been solely responsible for payment of interest when unsubsidized loans are taken. Some researchers have suggested that students feel that loans improve access to higher education, but the cost of repayment can be difficult (Baum & O'Malley, 2003). As a result, many students have been hesitant to take out loans, and some default on repayment (Dowd & Coury, 2006; Herzog).

Financial aid awards have changed over the last two decades (Heller, 2005; Singell & Stater, 2006). The percentage of need-based grants has decreased in comparison with merit-based grants. In addition, loans have comprised a greater percentage of total

financial aid packages than in the past (Price, 2004). Concern has been expressed regarding this shift in financial assistance and how it influences access and completion rates (Archibald, 2002; DesJardins, Ahlburg, & McCall, 2006; Perna, 2006). It has been unclear as to whether aid dollars were being spent in the most effective manner (Wilkerson, 2005).

The trends in student financial aid have indicated that there are more dollars available to students in 2006 than there were ten years prior to that date (College Board, 2006). According to the College Board (2006a), approximately \$69 billion was awarded to students during the 1995-1996 academic year with the average aid per FTE awarded at \$4,100. During the academic year 2005-2006, that dollar amount increased to about \$134 billion, and the average grant aid award jumped to over \$10,000 per student. Major sources of grant aid have been Pell, state, and institution based grants. Much of the increase in total financial aid during the 2005-2006 academic year was due to a larger percentage of loans being taken out in proportion to grant awards.

In order to fully comprehend the changes occurring in education affordability, one needs to consider that tuition and fees have been rising, and this has counteracted the increase in aid. Holding dollar values constant, the College Board (2006b) calculated that student higher educational costs rose from a little less than \$9,000 in 1994 to almost \$13,000 in 2006.

The actual decline in grant aid in relationship to tuition and fees is depicted in Figure 1. Displayed are the declines in Pell Grant money between 1985-1986 and 2004-2005 for both private and public colleges in terms of a percentage of the total tuition, fees, room, and board.

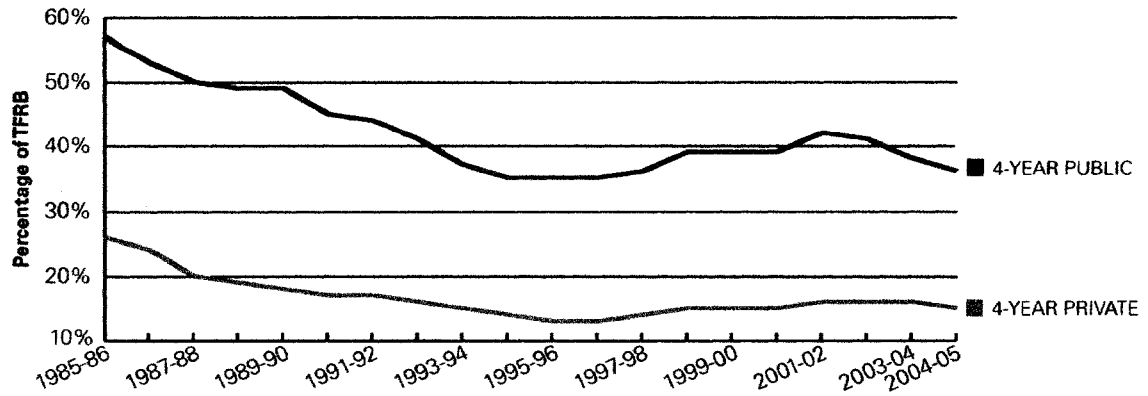


Figure 1. Maximum Pell Grant at public and private four-year colleges and universities as a percentage of tuition, fees, room, and board (TFRB) charges, from 1986 to 2005 (College Board, 2005).

Minority groups have faced additional hardships in paying for higher education due to lower income levels (Cabrera & La Nasa, 2001). Financial aid has not met the needs of low-income and minority U.S. citizens (Cabrera & La Nasa; Perna & Li, 2006). Not all racial/ethnic groups have had the same amount of need, and awards have not been consistent across all racial/ethnic student groups. Between 1997 and 2002, Nora, Barlow, & Crisp, (2006) noted several changes in the average amount of loans and grants allotted have occurred (see Table 1). For all racial/ethnic groups, Nora et al (2006) found that the percentage of the higher educational costs covered by grant aid has been reduced, while the percentage of costs covered by loans has increased over the same timeframe.

Table 1

Financial Aid by Type and Racial/Ethnic Group

Financial factor by category	Average amount received in U.S. dollars					
	1997 to 1998	1998 to 1999	1999 to 2000	2000 to 2001	2001 to 2002	2002 to 2003
Grants/ scholarships ^a						
White	2,210	2,245	2,297	2,340	2,794	2,582
Black	2,527	2,314	2,416	2,958	2,975	2,668
Hispanic	2,446	2,493	2,802	3,092	3,140	2,701
Student loans ^b						
White	2,641	2,935	4,296	5,149	5,508	6,940
Black	3,145	3,234	4,582	5,564	5,301	5,394
Hispanic	2,472	2,599	3,464	4,272	4,152	4,911

^aGrants and scholarships represent a sum total in three major grant and scholarship categories (e.g., Pell and state grants).

^bLoans represent a sum total in all of the major loan categories (e.g., Stafford and Perkins loans).

Providing adequate aid to students has been a concern for many researchers, because financial assistance appears to be associated with college access, choice, and persistence to graduation (St. John, Paulsen, & Carter, 2005; Trent, Lee, & Owens-Nicholson, 2006; Zarate & Pachon, 2006). Research on whether financial aid improves student graduation rates has produced mixed results depending on what student groups were studied and how financial aid was defined (Kerkvliet & Nowell, 2005; Perna & Li, 2006; Singell, 2004). Some findings have indicated that all forms of aid improve college persistence (Johnson, 2006; St. John et al.). Conversely, other findings have indicated that certain types of financial aid, such as loans, may hinder student access and degree attainment (Kerkvliet & Nowell; Singell; Swail, Redd, & Perna, 2003).

Aid has not only been offered to students directly; some has been made available indirectly through higher educational institutions. The federal government is only one source of grant money offered directly to students. Some federal funding has been

indirectly available to assist in the education of students attending Historically Black Colleges and Universities (HBCUs) and Hispanic Serving Institutions (HSIs). These institutions have received additional financial assistance funded by the United States government's Higher Education Act (HEA). Aid through Titles III and V (Merisotis & McCarthy, 2005) have been available to certain types of institutions. Title III dollars have been awarded to HBCUs and tribal colleges. HSIs have been eligible for Title V.

However, aid has not automatically been given to these institutions. HSIs must apply for funding that is awarded to these types of institutions through a competitive process.

The overall goal of Title III and V funding has been to provide additional money to improve student success. Thus, these funds have been intended to increase access and graduation rates. How the Title III and V monies were influencing student graduation rates at the four institution types has not been researched prior to this study and therefore has not been known.

Research on Latino/student completion rates at HSIs has indicated that rates are considerably higher at HSIs than at non-HSIs (Stearns, Watanabe, & Snyder, 2002). At HSIs, graduation rates of all students attending HSIs were nearly 40% in 1999. At HBCUs, graduation rates of all students have been similar to those at historically White colleges and universities even though these institutions have faced financial difficulties and have tended to have students who are less prepared for a higher education than students attending historically White colleges (Kim & Conrad, 2006).

Research could not be found that compared graduation rates and financial aid at HSIs, HBCUs, and institutions that were neither HSIs nor HBCUs. Without definitive research findings, policy decisions related to student success regarding the allocation of financial

aid dollars cannot be based on empirical data (Heller, 2005). Thus, financial aid dollars may be being spent on programs that do not increase student success.

Statement of the Problem

There has been a lack of understanding regarding how financial aid influences the success of students who attend HSIs, HBCUs, HMSIs, and PWIs. It is not known whether financial aid has been effective in terms of student access to higher education. Further, it has not been known whether financial aid impacts student graduation rates differently at the four institution types. Without empirical research connecting financial aid to graduation rates across these institutions, the policy decisions regarding the allocation of fiscal resources to improve student success through increasing access, choice, and graduation rates have remained largely uninformed. More needs to be known regarding how governmental investment in financial aid influences student success.

Purpose of the Study

The purpose of this study was to identify trends in student success. To do this, trends were analyzed in graduation rates and amounts of financial aid offered at HSIs, HBCUs, low (less than 25%) minority serving institutions that are neither HSIs nor HBCUs (PWIs), and high (25% or higher) minority serving institutions that are neither HSIs nor HBCUs (HMSIs). In addition, a second purpose was to determine if different types of financial aid were predictive of graduation rates at four-year public, not-for profit, government supported, degree-granting institutions in the United States. The study

focused on first time, full-time, degree-seeking students between 1999 and 2005 at HSIs, HBCUs, HMSIs, and PWIs.

Underlying Assumptions

An assumption of this study was that information regarding institutional characteristics, student financial aid, and graduation rates between academic year 1998/1999 and 2004/2005 that was obtained from the National Center for Education Statistics (NCES) was complete and accurate.

A second assumption is that HSIs and HBCUs could serve as a proxy for low-income and minority students.

Research Questions

Following are the five main research questions that guided this research project.

Research Question 1: What were the trends in graduation rates of students between 1999 and 2005 at Hispanic Serving Institutions (HSIs), Historically Black Colleges and Universities (HBCUs), neither HSIs nor HBCUs institutions that serve high (25% or higher) populations of minority students (HMSIs), and Predominantly White Institutions (PWIs)?

Research Question 2: What were trends in financial aid (average federal grant aid, average amount of state/local grants, average amount of institution grants, and average amount of loans) received by students between 1999 and 2005 at HSIs, HBCUs, HMSIs, and PWIs?

Research Question 3: Were there significant differences between the graduation rates of all first-time, full-time students in 2005 at HSIs, HBCUs, HMSIs, and PWIs?

Research Question 4: Were there significant differences between the types of financial aid received by students during 2005 at HSIs, HBCUs, HMSIs, and PWIs?

Research Question 5: Were specific combinations of financial aid (average federal grant aid, average amount of state/local grants, average amount of institution grants, and average amount of loans) received by students in 1999 significantly associated with 2005 graduation rates at HSIs, HBCUs, HMSIs, and PWIs?

Significance of Research

Demographics within the United States have changed rapidly (Flores, Horn, & Crisp, 2006). At the time of the present study, Latino/as and African Americans were becoming the “new majority” (Merisotis & McCarthy, 2005) and represented the largest minority groups in terms of percentage of the United States’ population. Yet, only a small percentage of students from these racial/ethnic groups have attended and graduated from a college or university (Hamrick & Stage, 2004). Students from minority groups who have attended HSIs and HBCUs seem to have been more successful as they have had higher graduation rates than those who attended other types of institutions.

For this and other reasons, HSIs and HBCUs have become important parts of the higher educational system in the United States and will likely become even more critical to economic growth through the next decade (Merisotis & McCarthy, 2005). With this expansion, educators need to know more about their effectiveness in promoting student

success and best practices at HSIs and HBCUs in order to serve students better and promote success.

Thus, this research was significant because it addressed the success of minority students. More specifically, it had the potential to assist in answering the question regarding whether investment in different types of financial aid were actually making a difference to student success. This work is important because research has not yet focused on similarities and differences in financial aid and how financial aid is correlated with graduation rates at HSIs, HBCUs, HMSIs, and PWIs. Understanding these issues could help administrators and politician fund types of aid that would best promote student success for all student groups.

Limitations

There are several limitations. The first is regarding the nature of the data which were collected and analyzed at the institutional level. Most research in this area has focused on student-level data and has compared specific minority groups' financial aid and retention rates with those of non-Hispanic Caucasian students. However, data on student-level financial aid provided to NCES by institutions over the last five to ten years has been very limited (IPEDS, 2007a). Connecting that financial aid data to student graduation rates at the individual level was not possible.

For this reason, the decision was made to look at institutional data. By examining data from multiple institutions and grouping similar institutions, inferences could be made regarding how aid influences student success of diverse populations. There are limitations to the application of study findings at the institutional level to individual student behavior

at the four types of institutions. Though it seemed reasonable to associate these variables, this study examined institutional level data at the national level; thus, the consideration of individual student behaviors was beyond the scope of this study.

A similar limitation of this study relates to inferences regarding specific behavior of racial/ethnic groups of students. Since specific student data were not analyzed separately, it was not possible to know how ethnic/minority groups' graduation rates were influenced by financial aid. Thus, an assumption was made that all students within a type of institution reacted similarly to financial aid; however, this may or may not be true. Similarly, not all students at every institution received financial aid. Due to limitations in the available data, they were included in the data pool even though it would have been preferred to remove their data from the study.

The third limitation also relates to the data. Data were used from the NCES and Integrated Postsecondary Education Data System (IPEDS). As institutions self report this data, there is a threat to validity since the information provided may not be accurate (Hofferth, 2005). Thus, findings of the study may be incorrect due to reporting errors. In addition, the IPEDS data were not complete. Graduation rate data from 2002 was not reported for any of the institutions.

The fourth limitation relates to changes in policy and practices. The statistical analysis was performed on previously collected data. Policies and practices in access, student aid, and graduation rates are always evolving. As a result, conclusions made about this data may not represent current practices.

The fifth limitation is due to the small number of publically funded HBCUs and HSIs in the United States. With a larger participant pool, differences become more obvious.

Statistically, this lack of data can result in a determination that there is no difference between groups when the opposite is true.

A sixth limitation concerns students' feeling of campus inclusion. It has been indicated that, particularly for minority students, feelings of campus inclusion influence student retention and graduation rates (Cabrera & Nora, 1993; Strauss & Volkwein, 2004). Due to the nature of this secondary data research, no attempt was made to assess the degree to which students felt connected to their campuses.

Another limitation was the decision to study only four-year, public institutions with the result that the findings may not be generalizable to two-year colleges and private universities. There were two reasons why only four-year, public institutions were included in this study. First, researchers have indicated that students who attend two-year institutions are different in many ways from those who attend four-year colleges and universities. Factors such as age, career plans, and financial resources differ between two-year students and four-year students (Bragg, Kim, & Barnett, 2006). As a result, the length of programs, graduation rates, tuition, and financial aid have been significantly dissimilar at these two institution types (Berkner & Wei, 2006). This has caused difficulty in making true comparisons involving the dissimilar groups.

Another reason public, four-year institutions were chosen was to provide some control in regard to the costs associated with higher education. It was assumed that public, four year institutions had similar tuition and fees. However, variations between states, regions, and types of institutions were observed (Gansemer, & Schuh, 2006). These were not controlled for statistically. Regional differences were evaluated through the use of "dummy variables" in the regression analysis. The sensitivity of this statistical

analysis could be questioned. Similarly, due to differences in funding and cost, private institutions were not used in this study. Thus, the results have limited, if any, applicability to private institutions.

Definitions

Academic year. This phrase is used to represent the fall through the spring term or semester. Throughout the dissertation it will be designated by the second half of the year. Thus, the academic year of 1998 through 1999 will be designated at “1999.”

African Americans. This denotes any person who has origins from Africa and any African-American racial group (U.S. Census, 2003).

Chicano. This term is used to represent persons of Hispanic heritage. It is less inclusive of the term “Hispanic” as it does not include persons from South America or Cuba (Castellanos & Jones, 2003).

Confounding variables. Variables that cause findings to be indiscernible. These include individual students’ previous experiences and institutional history.

Degree/certificate-seeking students. These are students who are enrolled in courses for credit at recognized institutions of higher education that offer degrees or other formal awards. At the undergraduate level, this includes students enrolled in both vocational and occupational programs (IPEDS, 2007b).

Federal Work Study. This is a program that allows students to work for at least minimum wage in order to meet financial need (National Association Foreign Student Advisors, 2006).

Financial aid. This is defined as any monetary assistance that assists in the funding of a higher education and includes grants, loans, assistantships, scholarships, fellowships, tuition waivers, tuition discounts, veterans' benefits, employer aid (tuition reimbursement) and other money (other than from relatives/friends) provided to students to meet educational expenses. This includes Title IV subsidized and unsubsidized student loans (IPEDS, 2007b). It also can include federal work-study money (National Association Foreign Student Advisors, 2006).

First-time students (undergraduate). These are students attending any institution for the first time at the undergraduate level. They may be students enrolled in either academic or occupational programs. Students who enrolled in the fall term who attended college for the first time in the prior summer term, and students who entered with advanced standing (college credits earned before graduation from high school) are also considered to be "first-time students" (IPEDS, 2007b).

Full-time students (undergraduate) are students who enrolled in 12 or more semester credits, 12 or more quarter credits, or 24 or more contact hours per week for each term (IPEDS, 2007b).

Financial aid package. This term is used to describe a combination of financial aid offered to students. It may include loans, grants, scholarships, or work-study. Monetary sources vary and can be federal, state/local, institution, or from private sources.

Graduation rate. The graduation rate is the percentage that is required by law to be disclosed under Student Right-to-Know. This rate is based on the total number of completers within 150% of normal time divided by the revised cohort not including allowable exclusions (IPEDS, 2007).

Hispanic Serving Institutions (HSIs). This is a designation made of a college or university by the Hispanic Association of Colleges and Universities (HACU). To be designated as such, the institution's student body must be made up of at least 25% FTE Latino/a students. The majority of HSIs are public institutions and receive federal funding (Dayton, Gonzalez-Vasquez, Martinez, & Plum, 2004).

High Minority Serving Institutions (HMSIs) that are neither HSIs nor HBCUs. This denotes any publicly funded, degree-granting college or university that has at least a 25% FTE minority student body.

Hispanic. See Latino/a.

Historically Black Colleges and Universities (HBCUs). This refers to any accredited college or university that was established prior to 1964 with the main purpose of educating African Americans (White House Initiative on Historically Black Colleges and Universities, 2006).

Institution grants. This is student financial aid provided in the form of scholarships and fellowships. These grants are funded by institutions and/or individual institution departments. Institution grants include scholarships targeted to individuals, such as those coming from a particular state, those studying a certain field, or athletes (IPEDS, 2007b).

Integrated Postsecondary Education Data System (IPEDS): This is a searchable database that includes a variety of information regarding higher education institutions. Data annually collected include completion rates, enrollment, finance, graduation rates, student and institutional characteristics (Bailey, 2006).

Latino/a. This is a term that represents persons from Latin American countries that now reside in the United States. Countries of origin include South America, Central

America, and North America. This expression is used interchangeably with Hispanic. There are some people who believe that Latino/a is more inclusive and preferred (Castellanos & Jones, 2003).

Loans. Loans to students refers to any monies used for higher education that must be repaid to a lending institution by the student. This denotes several types of loans, including Title IV subsidized and unsubsidized loans, and all institutionally and privately sponsored loans. This does not include loans to parents and/or PLUS loans (IPEDS, 2007b).

Merit aid. This form of state funded aid is given to students regardless of financial need (Archibald, 2002).

Need-based aid. This type of financial aid is awarded to students because of proven financial need rather than performance, as is often the case with merit aid. *Pell Grants* are a form of need-based aid (Archibald, 2002).

Low Minority Serving Institutions that are neither HSIs nor HBCUs. This terminology refers to any public, degree-granting college or university that has at least a 25% minority student body.

Persistence. See *Retention*.

Pell Grants. This form of federal financial aid is given to students who demonstrate financial need. The amount varies, but the average amount is about \$2,500 (College Board, 2006a).

Predominantly White Institutions (PWIs). This term is used to describe public, four-year institutions that have less than a 25% minority student population.

Public institutions. These are defined as colleges and universities that are not-for-profit, not privately owned, and supported by public funds.

Scholarships. This term is used to describe money given to students and is not repaid. Scholarships can be provided as a result of either financial need or student merit (National Association Foreign Student Advisors, 2006).

State/local grants. State and local monies are awarded to the institution under state and local student aid programs, including the state portion of State Student Incentives Grants (SSIG) (IPEDS, 2007b).

Study groups. This phrase is used to describe the four institution types used in the study. The groups are HSIs, HBCUs, HMSIs, and PWIs.

Retention. This term refers to the maintenance, creation, and support of the ongoing process of meeting personal, financial, social, and financial needs in order to continue in a program of study (Castellanos & Jones, 2003). It is used interchangeably with persistence and is linked to degree completion and graduation rates, since students who are not retained in higher education will not complete their degrees and graduate.

Title I. The Higher Education Act (HEA) consists of seven different sections, each of which is called a "Title." The first, Title I, is also called "General Provisions" and describes federal funding of educational programs in the United States (Congressional Research Services Report, 2002).

Title III. This section of the HEA called "Institutional Aid" describes aid offered to selected educational institutions such as tribal colleges and HBCUs (Congressional Research Services Report, 2002).

Title IV. This provision of the HEA is titled “Student Assistances” and authorizes several student assistance programs. These include Pell grants, work-study, student loans, TRIO programs, and the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) (Congressional Research Services Report, 2002).

Title V. This section of the HEA is titled “Developing Institutions.” It authorizes HSIs to receive annual support from the federal government.

CHAPTER 2

LITERATURE REVIEW

Researchers and theorists have indicated that many variables influence higher education student success including financial aid, social support, academic preparedness (Longerbeam, Sedlacek, & Alatorre, 2004), and race/ethnicity (Nora, Cabrera, Hagedorn, & Pascarella, 1996; Oseguera, 2005). Students from different socioeconomic and racial/ethnic backgrounds have reacted to financial aid packaging in dissimilar manners. In fact, researchers have found that not all forms of aid are helpful in access and retaining every student group (Below, 2003).

However, findings have been contradictory. Definitive research explicating the connections between financial aid and success in terms of student graduation rates is lacking (Perna, 2006). As a result, current financial aid policy decisions have often not been based on facts or empirical evidence but have been based on ungrounded assumptions. Consequently, some researchers have claimed that financial aid programs are detrimental to students' progress (Archibald, 2002; Nora, et al., 2006). Thus, in order to more efficiently retain students, institutional administrators and policy makers need to have additional research-based information regarding the varying effects of aid on specific student groups (Laden, Milem, & Crowson, 2000).

In this chapter, a literature review is provided that focuses on the history of financial aid, factors that influence student graduation rates, types of financial aid, the influence of

financial aid on specific racial/ethnic groups of students, Hispanic Serving Institutions, and Historically Black Colleges and Universities. Toward the chapter's end, a summary of the most pertinent information is offered, and conclusions are made regarding how financial aid has influenced retention. Finally, gaps in knowledge are described, and the need for additional research regarding student retention is discussed.

Financial Aid Issues

Financial aid programs have changed over the years, particularly within the last 20 years (Hearn, 2001). The distribution of aid has changed, and different student groups are now applying for assistance (Wilkerson, 2005). These alterations have resulted in new dilemmas for policy makers and administrators regarding efficient use of dollars (Archibald, 2002). In the next several pages, information is presented that provides insight into the historical changes in financial aid. This is followed by current data and research on student financial assistance. A focus is placed on minority students; however, other student groups have been included in the review of literature.

Historical View of Financial Aid

How students and their families pay for higher education has been an ongoing problem in the United States since the founding of Harvard in 1636. Even greater difficulties in financing advanced education have been experienced by those in lower income groups, such as Latino/a and African American citizens (Williams & Swail, 2005).

The struggle to fund postsecondary education was lessened for many following World War II when the Serviceman Readjustment Act provided funding for veterans.

According to Cohen (1998), this act known as the G.I. Bill had a great effect on access to postsecondary education in the United States. It provided financial aid for servicemen who, without the act, may not have been able to attend higher educational institutions. Through giving servicemen money to pay for schooling, this act opened the doors of higher education to a more diverse group of people. In addition, the G.I. Bill changed the relationship between higher education and the federal government. After the bill was passed, the federal government indirectly began financing student access for the first time in the history of the United States (Archibald, 2002).

The Higher Education Act of 1965 also had an influence on higher education finance and student access (Archibald, 2002). First, it made scholarship money available to students who were economically disadvantaged and could not pay for postsecondary education (Orfield, 2005). In addition, money was disbursed to struggling schools to improve postsecondary education.

Since the initial Act was signed, several revisions have provided additional money for a variety of services such as *TRIO* (Swail, 2006). *TRIO* grew out of a program that was initiated in 1964 called *Upward Bound* which was developed through the Economic Opportunity Act. What started as three programs has expanded and has provided a variety of services to first generation, low-income students. It has included programs such as Gaining Early Awareness and Readiness for Undergraduates (GEAR UP), *Upward Bound*, and *Talent Search*. Services such as mentoring have been initiated in middle school and have continued as students transition into colleges and universities (Merisotis & McCarthy, 2005).

Over the years, policies regarding student access through financial aid have shifted. This was particularly true in the early 1970s with the refinement of Title IV (Hearn, 2001). According to Hearn, a greater emphasis was placed on student choices and the role of financial aid in student persistence beginning in the 1970s. As a result, aid became more student-based than institutionally based through the Basic Educational Opportunity Grant Program (BEOG) of 1972. In other words, students were given more control of how aid was spent, and less control was retained by institutions of higher education.

Another influential act, the Middle Income Student Assistance Act of 1978, began a shift in aid dispersal. This has been considered to be a turning point in financial aid (Hearn, 2001; Heller, 2005; Orfield, 2005). Since this act opened up financial aid to students from higher income levels than had previously been allowed, more students became eligible for federally funded Pell Grants. In addition, loan eligibility qualifications changed to allow more students to take out loans. Even though initially this was considered to be a positive step towards affordability for all students, citizens became alarmed by the rise in federal dollars used to fund financial aid (Hearn, 2001). This concern fueled a movement to reduce grant aid and increase the amounts of loans provided to students. As a result, there was a shift in aid from grants to loans. This has continued and has resulted in a greater student financial burden (Heller; Perna, 2006).

Financial Issues in Higher Education

Over the last two decades, many changes have occurred in the financing of higher education (Johnstone, 2006). Alterations have been evident in financial aid programs and in the pricing of higher education (Heller, 2005). Between 1996 and 2006, tuition and room and board have increased by about 30% (College Board, 2006b). In terms of

constant dollars, the average tuition at a four-year public institution during 2006-2007 increased to more than \$12,000. Part of the climb in tuition costs has been due to state and federal reductions in the per-student funding of higher education (Paulsen & St. John, 2002).

Price has affected minority students differently than it has non-Hispanic White students (Heller, 2005). This could be attributed to this student population's increased sensitivity to pricing as it relates to access (Nora, 2003). In addition, Latino/a and African American students have tended to come from lower-income families for whom higher education has been less affordable and, thus, less obtainable (Heller; Williams & Swail, 2005). As a result, the amount and type of financial aid available has been very important to students' decisions to enter and persist in higher education (Heller). Yet, research regarding how financial aid influences persistence has been inconclusive (Wei, Horn & Carroll, 2002).

Student Financial Aid

As noted, due to policy issues, changes in program funding have occurred in financial aid available to higher education students (Baum & O'Malley, 2003; Dowd & Coury, 2006). In the next section, information regarding federal grants, state grants, institution grants, and loans is presented in order to provide a basis for understanding how these aid programs may have influenced graduation rates.

Several significant changes have occurred in financial aid awards since the 1990s. Overall, the dollar amount of financial aid offered today has increased over the last ten years (College Board, 2006a). However, not all types of aid have risen at the same rate. The percentage of aid offered as federal and institution grants has been reduced during

this time (see Figure 2). Another change in institutionally funded grant aid has been a shift from awarding on the basis of financial need of students to determining awards based on student abilities (Heller, 2004). Furthermore, the percentage of aid offered as loans has risen, and this has resulted in a larger percentage of financial aid money received by students being obtained through loans.

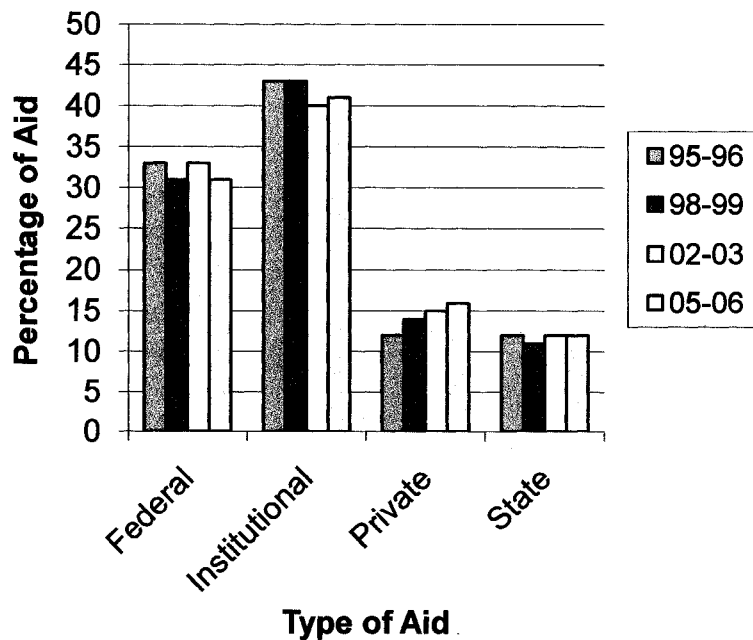


Figure 2. Trends in percentage of grant aid awards 1996 through 2006 (College Board, 2006a).

Financial Aid Applicants and Recipients

Latino/a and African American undergraduate students in large numbers have come to rely heavily on all types of financial aid for educational access (Berkner & Wei, 2006). During the 2003-2004 academic year, approximately 80% of Latino/a and African American students applied for assistance. A greater percentage of African Americans

(76%) than Latinos (63%) received aid (see Table 2). The average amount awarded was also higher for African Americans than Latinos. The major portion of financial aid support for both groups came from federal funding.

In total amount of aid received, according to Berkner and Wei (2006), Latinos on average were awarded the least amount of money with overall per student aid totaling \$6,253. In terms of federal financial aid dollars, Latino/a students on average received less than Asian, non-Hispanic White students, and African American students (see Table 2).

Table 2

Financial Aid Awards by Racial/Ethnic Group in 2004

	Average all groups	Latino	Non- Hispanic White	African American	Asian
Percentage applied any aid	74%	78%	72%	86%	66%
Overall aid awarded	\$6,890	\$6,253	\$6,955	\$6,933	\$7,623
Federal aid in percentage of students received	46%	50%	NA*	62%	NA*
Federal aid in dollars awarded	\$6,085	\$5,415	\$6,230	\$6,145	\$5,995
Receiving any financial aid in percentage	61%	63%	61%	76%	51%

*NA represents information that was not available.

The disparity in awards may be explained through the award process. Financial aid awards have been traditionally based on student financial need (Heller, 2005) with more need equating to greater amounts of aid awarded (Wilkerson, 2005). This has influenced

awards because White and Asian students have often appeared to be more needy than minority students because they were more likely to attend higher priced institutions than were African American or Latino/a students (Heller). Minority and low-income students' need has often appeared to be less because these groups of students have tended to live at home in order to save money. This has resulted in less grant aid being awarded to minority students (Heller).

Federal Grants

Even though a lower percentage of aid is coming from the federal grant program, the dollar amount of federal grant money and percentage of students awarded federal grant aid had been rising steadily until 2004-2005 (College Board, 2006a). Since then, a drop in federal grant aid has occurred. Between 2004-2005 and 2005-2006, the total expenditure for federal grants decreased from \$13.6 billion to \$12.7 billion. In terms of per-student money, each recipient was awarded about \$120 less in 2005-2006 than in 2004-2005 (College Board, 2006a). During that same time, the cost of attending higher education institutions rose and left students with less federal grant money to pay for their education (College Board, 2006a).

State Grants

How states are awarding state aid has also changed (College Board, 2006a). This has been due to evolving state goals for financial aid (Davis, 2001). Goals can be classified as either to providing access to low-income students, enhancing student choices, or increasing retention. It has been important for politicians to identify state goals since these goals influence how grants are funded. Many state legislators have not articulated

the goals of their aid programs, and this has led to poor financial aid decision making (Davis; Wilkerson, 2005).

Archibald (2002) and Heller (2005) have noted that there is a trend in the rise of merit-based awards. Figure 3 presents national trend data regarding the increase in merit based aid over need based aid (College Board, 2006a). The result is that aid has not been reaching students who have the greatest need. Instead, state grant aid has been given to students who are meritorious (Heller). This form of financial assistance is called *merit aid* and is usually awarded based on the students' abilities and achievements rather than on financial need (Heller).

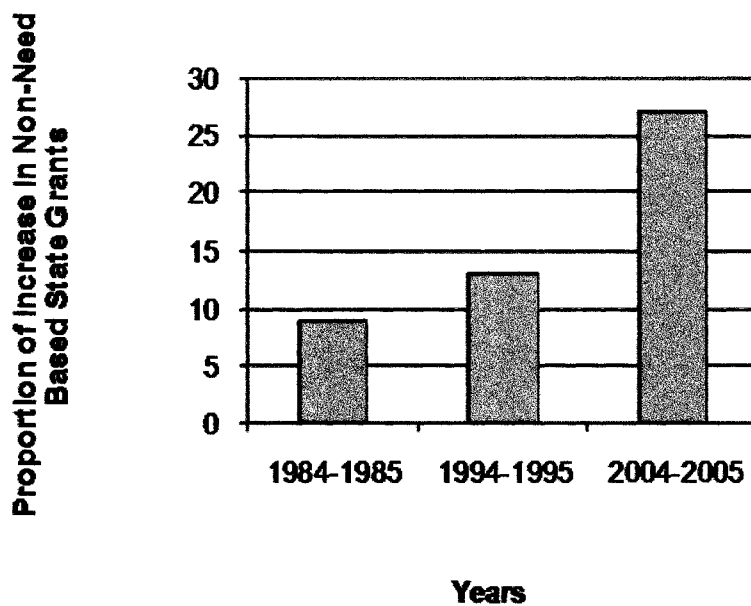


Figure 3. Proportion of increase in the non-need based state grants during 1984-1985, 1994-1995, and 2004-2005.

Even though well articulated goals are important to decision making, state politicians and administrators have often been in conflict regarding the outcomes of a state aid program. Some have been able to define goals. Sometimes, however, when goals have been defined, the money spent may not have resulted in the desired outcome (Davis, 2001). Though politicians and administrators may hold the belief that state grant aid can positively influence student outcomes such as access and retention, this may not necessarily be true (Davis). Due to the many variables that have influenced student success, allocated money has often not had the intended result of promoting student success (Davis, 2001).

Institution Grants

Merit-based aid awards have also replaced many financial need-based scholarship programs at U.S. higher educational institutions resulting in a smaller amount of grant dollars going to the students with the most need (Heller, 2004; Perna, 2006). However, there has been an increase in the overall amount of dollars offered by institutions (see Figure 4). This has, to some extent, offset the loss of need-based aid.

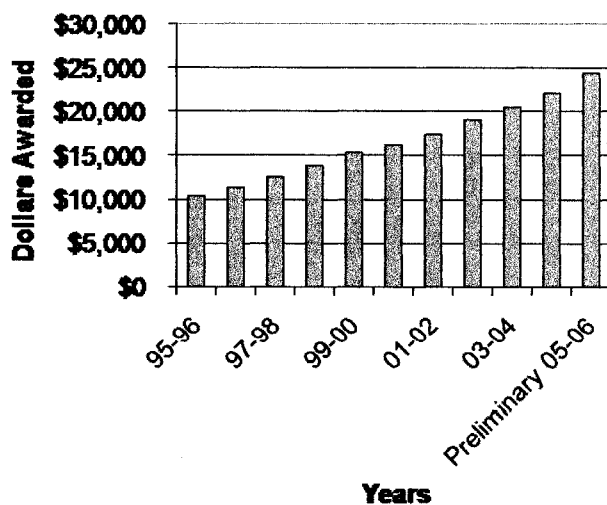


Figure 4. Changes in institution grant awards from 1995-1996 through 2005-2006.

Loans

Students have increasingly been taking on the financial burden of larger loan amounts to pay for their higher education (College Board, 2006a). Research performed by the College Board (2006a) yielded findings indicating that, on average, graduating seniors of public institutions in 2005 owed more than \$15,000 in educational loans.

Increasingly, postsecondary students from all racial and ethnic groups have been relying more on loans than other types of aid (Heller, 2005; Paulsen & St. John, 2002). Researchers have indicated that Latino/a students, often reluctant to take on debt, have done so in order to attend higher education institutions (Swail, Redd, & Perna, 2003).

Summary

Financial aid has changed over the years. In the past, the main purpose has been to improve student success of those who did not have the financial resources to pay for a higher education. In previous decades most of the assistance was given to the neediest students who could not afford to attend a college or university. However, in recent years, a greater percentage of aid has been granted in the form of loans and merit based aid and has not necessarily been awarded to the lowest income students. As a result, student success through access and improved student graduation rates has been in jeopardy.

Student Retention

The subject of graduation rates, as a form of student success, has been of interest to many administrators, educators, and researchers (Gleason & Dynarski, 2002; Guiffrida, 2006; Tinto, 1975). Researchers have identified multiple variables that affect graduation rates (Johnson, 2006). Most of the studies have focused on student characteristics and the

direct environmental impact on retention and degree attainment (Braxton, 2002).

Demographics, personality, and learning environments have been found to influence graduation rates (Pascarella & Terenzini, 2005). Yet, a clear understanding of other variables, such as monetary assistance and socioeconomic influences, have not been well understood (Carter, 2006; Castellanos & Jones, 2003; Tinto, 1993). In the next section, research findings are presented concerning student success through retention. This is followed by a review of literature regarding financial issues that relate to whether students graduate.

Changes in Graduation Rates

Gaither (1999) wrote that student success as defined through retention rates has been declining. This is particularly true among minority groups. Yet, little evidence has confirmed these assertions. It has not been suggested that students at the time of the present study were less likely to graduate than students who attended colleges and universities in the mid 1990s (Patton, Morelon, Whitehead, & Hossler, 2006). Not all have agreed that higher education is in a downward spiral; many believe that the graduation rates in the United States are improving rather than declining. For example, in a study performed by Horn and Berger (2004), it was found that graduation rates between 1989-1990 and 1995-1996 did not change. There was, in fact, an increase in persistence.

Thus far, there has not been a definitive explanation of reason for the change in graduation rates (St. John & Wilkerson, 2006). There have been some suggestions that interventions such as counseling programs, mentoring programs, the use of learning communities, transition programs, and faculty interactions may play a role in improving retention and graduation rates (Kuh, Kinzie, Schuh, McKinzie, & Associates, 2005).

However, no strong empirical data has been reported to support this conclusion (Patton et al., 2006).

Retention Theory

Numerous theories and models have been created to explain student retention and degree attainment (Swail, Redd, & Perna, 2003). Nagasawa and Wong (1999) developed a classification system for retention models. These models focus on different aspects of retention including psychological, environmental, economic, organizational, or interactional conditions.

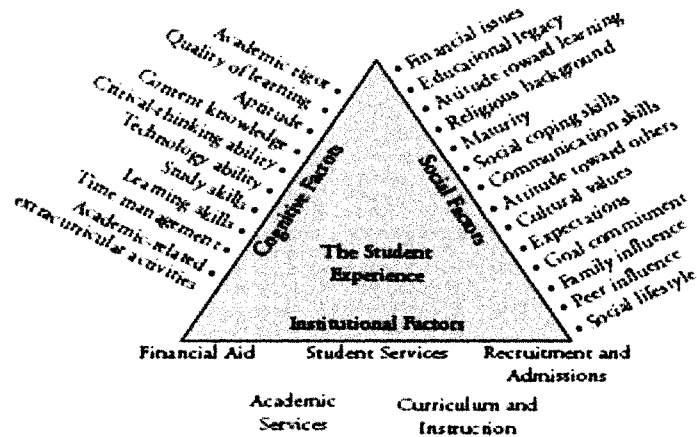
Tinto (1975) developed one such theory, interactional theory. Even though it has often been referenced, Tinto's theory has been criticized because it did not take into account financial issues and the unique needs of minority groups (Swail et al., 2003). As a result, this theory has fallen into disfavor by researchers studying minority populations (Torres, 2006).

A retention model created by Swail et al (2003) is entitled the Geometric Model of Student Persistence and Achievement (see Figure 5). It includes three main factors: cognitive, institutional, and social. Each can have positive or negative influences on students that determine whether they leave before their program of study is completed or will be able to persist to graduation.

Cognitive factors that the model addresses include student aptitude, study skills, and time management skills. Social influences comprise student attitudes, financial support, goals, and family support. Institutional factors include academic and student services and include financial aid. However, in this model, aid is not limited to assistance provided by

the institution itself. In developing the model, Swail looked beyond school walls and included federal, state and institution financial aid packaging.

Forces Acting on the Geometric Model of Student Persistence and Achievement



Retaining Minority Students in Higher Education

Figure 5. Geometric Model of Student Persistence and Achievement (Swail et al., 2003).

In applying this model to financial considerations, Swail suggested that students' graduation rates were influenced by amount of aid and the perception of the adequacy of assistance from family, institutions, and other sources. The exact dollar amounts were not the only influence on whether students believed that higher education was affordable. Attitude, personal needs, and beliefs were also viewed as capable of swaying students' perceptions of affordability and thus their desire to graduate.

In conclusion, the Geometric Model of retention illustrates relationships between variables. According to Swail et al. (2003), graduation rates are affected by cognitive, social, and institutional factors. Institutions play a role by providing financial aid and student services that can influence the likelihood of students graduating.

Retention and Graduation Rate Research

Many researchers have examined factors that influence student retention, persistence, completion, and graduation rates (Herzog, 2006; Ishitani, 2006, Horn & Berger, 2004). Even though these three concepts are not identical in meaning, each are highly correlated (Bean & Eaton, 2000). This is because students need to be retained and persist in higher education in order to complete programs and for society to reap the full return on the investment made in their education. As a result, research that focuses on each of student retention, persistence, completion, and graduation rates is pertinent to this investigation.

Research findings regarding variables that influence students' persistence have been conflicting (Pascarella & Terenzini, 2005). Study results concerning student graduation have been weak in terms of design and application of results (St. John & Wilkerson, 2006). Still, many studies are worth noting. In the next several pages, studies are presented that describe factors that influence retention and student graduation rates.

The majority of student success through persistence research has focused on students and aspects of the students' environment that influence graduation rates (Barefoot, 2004). These "input" models have focused on defining what student factors are associated with degree attainment (Ryan, 2004). The underlying premise has been that if these factors are used in choosing students for admission, graduation statistics will improve. There are limitations to the line of research in that the results have not necessarily been focused on institutional best practices to assist in improving graduation rates (Ryan, 2005).

As a result, some researchers have looked beyond student characteristics in order to get a deeper understanding of why students do not graduate (Barefoot, 2004; Braunstein & McGrath, 1999). Increasingly, attention has been devoted to issues larger than

race/ethnicity or family income. Many studies have focused on variables that influence student graduation rates (Pascarella & Terenzini, 2005). Additional variables such as federal expenditures on grant aid, state economic support for higher educational institutions, and university variables that influence graduation rates have been investigated (Zhang, 2006).

Institution Size

A frequently researched topic has been the relationship of institution size to graduation rates. Findings from Stoecker and Pascarella (1991) indicate that the number of enrolled students may play an indirect role in retention. The researchers believed that as institution size increased, student involvement would decrease. Thus, a lack of engagement at larger institutions may have caused students to leave before graduation. Astin, Tsui, and Avalos (1996) also studied the influence of institution size on student retention. Findings from their research indicate that diverse ethnic groups react differently to student body numbers. In another study, lower income students attending larger institutions were less likely to graduate than higher income students attending the same size institutions (Horn, 2006). Study results indicated that low-income students were more likely to graduate if they attended smaller institutions than larger colleges or universities.

Institution Types

Purposes and the goals of different types of institutions have also been a focus of research (Pascarella & Terenzini, 2005). Using data collected in a 2002 analysis performed by the National Education Association (2004), a strong relationship between institution type and graduation rates was suggested (see Figure 6). From this figure, it is

evident that different types of institutions have had dissimilar graduation rates. Private research institutions had the highest average graduation rate, while students who attended public, comprehensive or liberal arts institutions were least likely to graduate.

Work by Ishitani (2006) was supportive of the idea that different types of institutions have different completion rates. This author found that, when studying first-time, first-year students, the type of institution attended did influence attrition and five-year degree completion.

On-Campus Housing

Student success (defined as retention) studies have been conducted that focus on the influence of on-campus and off-campus housing (Skahill, 2002-2003; Torres, 2006). Commuter schools have been found to have lower graduation rates than residential institutions (Torres). Laden, Milem, and Crowson (2000), as a result of their research, suggested that students who live off campus experienced a “prolonged stranger-ness” and thus did not feel a part of the community (p. 247). Skahill (2002-2003) found that with commuter students, the reduced retention rates were due to a lack of social connections.

Another related institution factor that has been studied is how well institutions promote student engagement and commitment (Ryan, 2005). There seem to be many factors that have influenced students’ levels of involvement with their campus. Ryan indicated that engagement is influenced by institution expenditures. In a study that used IPEDS and National Survey of Student Engagement data, it was indicated that as more money was spent on administrative costs, there was a reduction in student engagement. Reporting on his earlier research, Ryan (2004) suggested that expenditures also relate to student graduation rates.

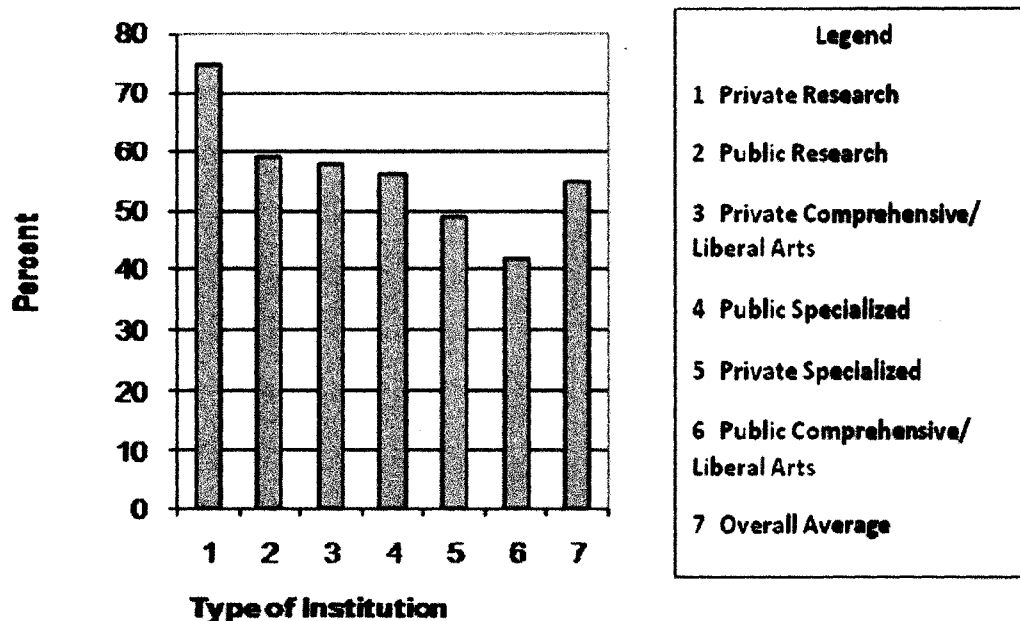


Figure 6. 2002 Graduation rates for different types of four-year colleges and universities (National Education Association, 2004).

Even though Ryan’s work indicated a link between engagement and expenditures, not all research results have yielded similar findings. Pike, Smart, Kuh, and Hayek (2006), using secondary data in conducting their research project, found that the relationship between expenditures and engagement was complicated and probably indirect. They concluded that expenditures may influence student engagement and affect graduation rates.

Students of Color Retention and Graduation Rates Research

Data analyzed by the U.S. Department of Education (2002) and St. John (1999) suggest that success as defined by graduation rates of Latino/a and African American students were lower than those of non-Hispanic Caucasian and Asian students at four-

year institutions (see Figure 7). There is not a simple explanation for this disparity, as many factors have been identified that influence the graduation rates of diverse students (Swail, Cabrera, & Lee, 2004). Studies that look specifically at students from under-represented groups of students are presented in the following pages.

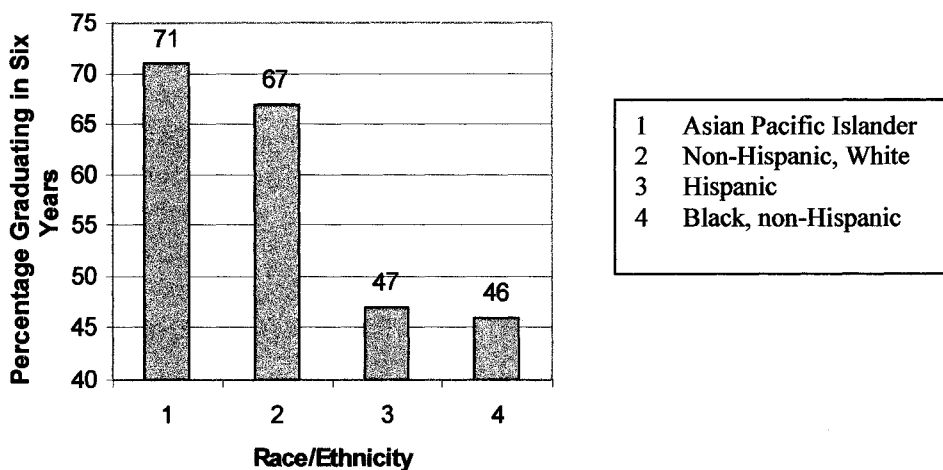


Figure 7. Six-year graduation rate by race/ethnicity for bachelor-seeking students starting at a four-year institution (U.S. Dept. of Education, 2002).

Connections with the campus environment appear to have influenced some racial/ethnic groups of students more than others. Castillo, Conoley, Choi-Pearson, Archuleta, Phoummarath, and Van Landingham (2006) have suggested that the use of an interactional model is helpful in explaining student actions and choices. According to Torres (2006), this was particularly true for Latino/a students who often have a high need for affiliation. As a result, Castillo et al. studied the campus climate and how it related specifically to Latino/a students' persistence attitudes. Surveys were used to obtain insights from this student group. Campus environment was determined to be an important

influence on students' feelings about leaving or continuing their studies. More specifically, students who did not feel valued and cared for were more likely to have non-persistence attitudes. Unfortunately, no comparison data were collected from non-Hispanic Caucasian or African American students. Nonetheless, Castillo et al. indicated that the needs of Latino/a students were different and college personnel needed to provide interventions that specifically addressed the requirements of this student population.

Several other researchers have examined Latino/a cultural aspects and their influences on retention (Gloria, Castellanos, Lopez, & Rosales, 2005; Gloria, Castellanos, & Orozco, 2005; Swail, Cabrera, & Lee, 2004). The theme of these studies was that in order for Latino/a students to persist, there must be an inviting campus climate that facilitates feelings of support and inclusion. These research projects focused on students at universities that served mainly non-Hispanic Caucasian students. The experience and needs of Latino/a students at Hispanic Serving Institutions (HSIs) may be different than students at predominately White schools.

Torres (2006) studied students at HSIs and at one predominately non-Hispanic Caucasian college. Data indicate that the needs of Latino/a students attending HSIs are different from non-Hispanic Caucasian students. The Latino/a students in his study tended to be commuters and were often first-generation students. Factors regarding inclusion, academic difficulties, family status, family responsibilities, satisfaction with faculty, and cultural affinity had an effect on persistence through the intervening variables of encouragement and academic integrity for the Latino/a students.

Torres (2006) also found that an important factor influencing student success was the environment, and the environment included relationships with family, friends, and faculty

members. Similar to findings by Gloria, Castellanos, Lopez, and Rosales (2005) and Gloria, Castellanos, and Orozco (2005), Torres reported that in order to be successful, students needed support and mentoring from these individuals. With guidance, students could be integrated into college programs, persist, and graduate after completing their programs of study.

This study by Torres (2006) did not address financial needs of students directly. However, he suggested that first generation Latino/a college students were in need of economic, social, and cultural capital. Torres (2004; 2006) believed success could be enhanced by assisting students in obtaining a clear picture of how they could obtain these types of capital.

Mason (1998) examined the factors that influenced male African American students' retention. The results of his quantitative and qualitative study indicated that many factors were significantly related to students' continuing in their programs. One key variable was students' perceptions of the environment, and this was influenced by having clear educational goals and outside encouragement. Other factors that made a difference included college cost, family finances, and feelings of hopelessness.

Astin, Tsui, and Avalos (1996) found that African American students attending HBCUs had higher graduation rates than did African American students who attended PWIs. This may be due to students' feeling a greater level of acceptance and support at HBCUs than at PWIs (Pascarella & Terenzini, 2005). Special HBCU programs that enhanced the retention of African American students (Nettles, Wagener, Millett, & Killenbeck, 1999) have enhanced this greater sense of community.

Kim and Conrad (2006) studied differences between degree attainment at HBCUs and Historically White Colleges and Universities (HWCUs). The results indicated that the graduation rates of HBCUs and HWCUs were not significantly different even though these were fairly dissimilar groups of institutions. The researchers found that the HBCUs had fewer economic resources and their students were less academically prepared than were students at the HWCUs. As a result, they applauded HBCUs for their success with such limited resources.

A study conducted by Berger and Milem (1999) used a social integration model to study retention of a mixed race group of students. Findings indicated that students who were more involved and committed were more likely to continue their education. Additional factors positively influencing retention included being White, being from higher income families, and being female. Students who were African American were not as likely to go forward in their schooling as White students. The authors did not study Latino/a students, so no direct conclusions could be drawn from this study regarding this group. However, one could surmise from the data that since Latino/a students tended to come from lower income families (Swail, Cabrera, & Lee, 2005), they would be less likely to be retained due to the influence of income and background on persistence.

Flowers (2006) performed another study that focused on race/ethnic differences. The researcher examined social and academic integration of first-year male African American students' and how these variables influenced retention. Flowers found, using data from the National Center of Educational Statistics, that students enrolled in four-year institutions had higher levels of socially and academically integration than their two-year counterparts. Flowers did not study how integration was influenced by financial aid, but

monetary considerations were taken into account. The researcher did identify family income as a factor that affected students' decisions to continue. Based on these data, one can conclude that in minority populations, persistence is multifaceted and students' experiences, perceptions, and financial considerations play roles in their education.

Other Factors Influencing Graduation Rates

Many additional factors have been shown to relate to persistence and graduation rates. The changing nature of higher education attendance has changed the reported graduation rates (Horn & Berger, 2004). Fewer students have been graduating in four years. Data indicate that only 46.8% of Hispanic students and 43.7% of African American students who began their education in 1998 at a four-year school had graduated four years later. This could be compared to 50.6% and 50.8% of a respective comparison group of students that had started six years earlier. Of the White students studied, 61.4% in 1990 had completed degrees, compared to 62.7% in 1996 (Horn & Berger). In 1996, 80.7% of White students either had graduated or were continuing with their studies. This could be compared to 70.5% of African American students and 75.8% of Latino/a students (Horn & Berger).

Other researchers have found conflicting results regarding attrition and graduation rates. Work by Ishitani (2003) indicated that minority students were less likely to drop out of higher education programs than were White students. Findings from a later study suggested that Hispanic and African American students took longer to reach their graduation than did White students (Ishitani, 2006); however, Alfonso (2006) indicated that Latino and non-Hispanic Caucasian students took about the same amount of time to attain degrees.

When considering time to completion, some researchers have examined the issues of student “stop-outs.” This term describes periods of time during which students suspend their enrollment (Johnson, 2006). Stop-outs need to be considered when studying student retention and graduation rates, because when students stop taking classes for a semester or more, the length of time to graduation increases (Horn & Carroll, 1998). Researchers have studied such behavior (Horn et al., 1998; Johnson, 2006). Using data from a public research university, Johnson found that minority students were more likely to stop-out and dropout than White students.

Another finding worth noting is that students’ likelihood of dropping out, stopping out, and returning to higher education have not remained constant over time (Johnson, 2006). Students have been found to be more likely to dropout and stop-out at specific times during their academic programs. Logically, students were found to be more likely to leave programs during summer rather than during the middle of semester. Johnson also found that persistence was positively influenced by all types of financial aid, including work-study, loans, and grants.

In a similar study, DesJardins, Ahlburg, and McCall (2006) examined the role of stop-outs of higher education students over time. Finances, income levels, ACT scores, GPA, high school standings, race/ethnicity, and gender influenced the likelihood of stop-outs, dropouts, and graduation rates. It was found that for each \$1,000 of financial aid received, students were between 17% and 34% less apt to have a first stop-out. This percentage was influenced by race/ethnicity but not by type of aid. Loans, merit aid, grant aid, and work-study supported student retention.

DesJardins, Ahlburg, and McCall (1999, 2002) also indicated the beneficial influence of financial aid on student retention. Both studies revealed that financial aid reduced higher education student stop-outs; and scholarships and work-study funds were the strongest influences. In both studies, data indicated that grants did not change the likelihood of students ending their schooling. Loans had some positive influences; however, data indicated that loans, later in students' education, increased the likelihood of stopping-out (1999).

A similar issue influencing minority students' graduation rates has been the many alternative paths to graduation (Bragg, Kim, & Barnett, 2006). Students have increasingly been earning credits from a variety of different institutions. Even though credits may be transferred, tracking students has been difficult (Hagedorn & Lester, 2006). This has resulted in problems with calculating and reporting accurate information about graduation rates (Bloese, 1999). Thus, data available and reported by colleges and universities may not be a true representation of student graduation rates (Herzog, 2006).

Summary Regarding Graduation and Retention Rates

Student retention and graduation rates have been a focus in higher education for many years. Several theories have been developed and multiple research projects have examined the variables related to students' decisions to enter and stay in higher education. From the investigative findings and theories, it can be concluded that students determine in part whether to graduate by how they view their resources and their environment. Interpretations of circumstance vary between individual students. In addition, factors that are important to one racial/ethnic student group may not be as

relevant to others. Even so, researchers and theorists have suggested that the environment is a strong determiner of persistence. This is particularly true for Latino/a students.

Retention, Graduation Rates, and Financial Aid

Monetary assistance has seemingly affected access, student retention, and graduation rates. However, different student groups respond in varying ways to types of financial aid (Carter, 2006). The influence of students' characteristics, financial aid, and persistence has been examined by Horn and Carroll (1998) and St. John, Paulsen, and Carter (2005). Comprehensive research on the effect of specific types of financial aid, however, has been lacking. Much of what is known has been derived from the work of a few researchers such as St. John (1990, 1991, 1999a, 1999b, & 2002) and Cabrera (Cabrera & La Nasa, 1993, 2001; Cabrera, Nora, & Castaneda, 1992; Cabrera, Nora, Terenzini, Pascarella, & Hagedorn, 1999). Findings have often been inconclusive and sometimes contradictory with large gaps in knowledge particularly regarding aid and racial/ethnic groups (St. John, Paulsen, & Carter, 2005). Even so, some literature was found. In the next several paragraphs, a review is presented of research in this area.

Research on Mixed Racial/Ethnic Students Groups

Research has been conducted that focuses on issues of financial aid and non-Caucasian students. St. John (1999b) conducted one of the first studies that examined the influence of financial aid on minority retention. This research project was focused on the persistence of four-year public college students between 1991 and 1993 in the state of Washington. The students studied were a mixture of racial/ethnic groups. Approximately, 20% of the 15,000 students studied were non-Hispanic Whites. Types of aid studied were

loan, work-study, grants, and combinations of the three. From the results, St. John concluded that all types of financial aid influenced persistence during 1993 but not during the first two years of the study. St. John speculated that findings were dissimilar because the types and amounts of aid changed over the years. A greater emphasis was placed on offering need-based grant aid in 1993 than in previous years. This change may have affected the relationship between aid and retention. In addition, St. John found that, for different racial/ethnic groups, different types of aid had varying influences on student persistence. It was found that in one year when grant aid increased for African American, Asian-American, and Hispanic students that the retention rates of Asian-American and Hispanic students also increased. St. John suggested that the grant aid was influential in reducing the inequities.

St. John's (1999b) findings were supported by the later findings of Johnson (2006). Results from Johnson's work also indicated that all types of aid--work-study, loans, and grants--increased the likelihood of students' degree attainment.

A study performed by Dowd and Coury (2006) illustrated that not all types of financial aid may have the same benefit. Studying community college students, the researchers found that loans had a negative effect on student retention and no effect on degree attainment. The authors believed that this was true because community college students can be discouraged by rising debt and this leads to early departure. As a result, the researchers concluded that loans were not an effective form of financial aid and should not be used to replace grant money.

Research performed by Herzog (2005) yielded similar results. Studying first-year students at a public, urban university, Herzog found that students who took unsubsidized

loans were less likely to continue in their program of studies than those who did not take these types of loans.

Gladieux and Perna (2005) also studied the relationship between loans and degree completion. In conducting this study, the researchers included other variables such as student risk factors. Some of the factors included working numerous hours each week, being first generation college students, and coming from low-income families. Results indicated that for students who did not have risk factors, loans did not reduce the likelihood of their degree completion. However, loans did have an influence on graduation rates of students who had risk factors.

Research conducted by Kerkvliet and Nowell (2005) compared the first-year student retention rates and financial aid at two large universities. One institution was located in a large city where most of the students lived off campus. The other was in a smaller, more rural community with the majority of students living on campus. For the rural, residential institution, work-study was highly correlated with retention, while the correlation of grants to retention was not as evident. At the more urban university, only grant aid was correlated with student retention. Loans did not seem to have a significant relationship to students' continuation at either university. From this, Kerkvliet and Nowell theorized that work-study improved retention by reducing students' financial concerns and increasing contact with faculty members. Beeson and Wessell (2002) had similar findings. The research performed by these researchers also suggested that work-study improved retention and graduation rates.

Research performed by Williford and Schaller (2005) has provided further insight into why students leave universities after the first year. These researchers surveyed

students who chose not to return to a four-year university. The students who did not persist reported several environmental reasons for leaving. These included not feeling like they “fit in” on campus. They also thought that their schoolmates were unfriendly. In addition, the non-persisting students reported that financial concerns were instrumental in their decision not to return. These concerns included inadequate financial aid, the high cost of attendance, and few on-campus jobs.

Price and Davis (2006) examined the influence of institution grant aid on student completion rates. More specifically, the researchers analyzed the influence of merit-based and need-based grants on degree completion. The findings indicated that students who received aid that was merit-based, need-based, or a combination of the two were more likely to complete their degrees than were students who did not receive any type of grant aid.

Gansemer and Schuh (2006) conducted a similar aid study. In their analysis, they found that institution grant aid was related to student retention for students attending moderately selective or non-selective institutions. However, students who attended highly selective institutions did not seem to benefit in terms of increased retention from this type of financial aid.

Singell and Stater (2006) performed another study that evaluated grant aid. These researchers studied a variety of racial/ethnic groups of students. There was a positive relationship between need-based aid, merit-based aid, and graduation rates. The association, however, was sometimes indirect and mediated through student selection. Singell et al. have suggested that merit-based grants attract students with higher levels of academic achievement who are more likely to complete degrees. In addition, they

concluded from their findings that need-based aid was essential for improving access for low-income and minority students. They suggested that recent policies should be reconsidered that have caused a shift from need-based to merit-based aid.

Research performed by Strauss and Volkwein (2004) was conducted to analyze student characteristics, financial aid, and commitment to two- and four-year higher educational institutions. Using a variety of methods and data sources, the researchers determined that students who received federal and state grants were more committed to their institutions. More committed students were retained to a higher degree than those with less commitment. From the results, the researchers concluded that aid does influence students' persistence indirectly by increasing their commitment.

A research project by Wei, Horn, and Carroll (2002) was designed to discover the effects of Pell Grants on student retention. The researchers found that students who received Pell Grants did not have higher persistence rates than did students who were non-aid recipients. Even so, they believed that Pell Grants were helpful in meeting students' needs. Wei et al. concluded that these grant recipients had more non-persistence risk factors that confounded the findings. Thus, receiving Pell Grants counteracted these variables but did not provide enough financial support to cause dramatic changes in students' persistence rates.

Other research that focused on students at two-year institutions had similar findings to the work of Wei et al. (2002). Metz (2001) found that Pell Grant awards were not positively correlated with degree completion rates. Even so, Metz found that loans and student work-study were positively associated with degree completion.

Robbins, Le, Davis, Carlstrom, Lauver, and Langley (2004) performed a meta-analysis of 109 retention studies. The findings indicated that there was a significant relationship between persistence and academic goals, self-efficacy, and related academic skills. In addition, socioeconomic status, financial support, and institution selectivity were correlated positively to student persistence. Robbins et al. concluded that when institutions minimized student financial strain, performance was enhanced and student persistence increased.

In summary, multiple research projects have been focused on the influence of financial aid on students. Many results are conflicting and do not provide clear connections between the different types of financial aid and students' decisions to complete their programs of study.

Aid and Specific Student Groups

Researchers have focused on specific student group needs in order to better understand why they react differently to cost changes and financial aid. Findings from recent studies are presented in the next several pages. At the end of this section is a brief summary.

A study conducted by Reynolds and Weagley (2003) focused on factors that promoted student retention and graduation rates. Through use of database sampling, the researchers found several correlations. In terms of student variables, students that were female, African American, or White were more likely to matriculate and graduate than were male and/or other racial/ethnic groups. In terms of financial aid, students who were given work-study financial aid were more likely to persist. Conversely, contradicting Metz' results, loans were found to significantly reduce the likelihood of graduation for all

students. Thus, the researchers concluded that specific types of aid affected student group retention in varying manners.

A project by St. John, Paulsen, and Carter (2005) compared African American and non-Hispanic White students in terms of received financial aid and retention. The researchers examined the influence of several demographic factors, tuition, aid, housing, and food costs on whether students continued their higher education. Forms of aid studied included grants, loans, and work-study. The results indicated that higher dollar amounts of grant money and loans were received by African American students. This was suggestive of African American students having a greater need than White students. The researchers also concluded that African American students attended less expensive institutions and their persistence was more strongly affected by changes in tuition and aid than the persistence of White students.

In addition, St. John et al. (2005) found that for African American students, grant aid had a stronger influence on retention than did loans or work-study. However, with the non-Hispanic White students, grant aid and work-study were both significantly associated with retention. It was concluded from this study that aid affected retention of diverse groups of students in differing ways.

Research conducted by Below (2003) focused on factors that influenced student persistence at four-year colleges. The National Center for Educational Statistics financial aid database was the source of research data. Financial aid did not seem to have a significantly different effect on the African American or White students' persistence. However, Hispanic students who stayed in the program had higher amounts of grant aid. For these students, those with higher debt loads were less likely to persist in college.

Horn (2006) evaluated graduation rates at four-year colleges by purpose, size, selectivity, race/ethnicity, and percentage of students receiving Pell Grants. Institutions with high numbers of Pell Grant recipients were labeled as *low-income enrollment* institutions. The results indicated that selectivity, the percentage of low-income students, and institution size were significantly associated with graduation rates. However, the influences of each variable were not consistent across all racial/ethnic student groups and institution type. For example, African American students' graduation rates at very selective bachelor-degree-granting institutions with large numbers of low-income students were higher than those of the White students attending those same institutions. Nevertheless, when Horn compared all institutions, there was an 18% point gap between White and African American students' graduation rates. There was also a difference between White and Hispanic students. On average, the gap between Hispanic and White students was 12%. From the data, the researcher concluded that graduation rates tended to be higher for White than African American or Hispanic students. In general, the differences between racial/ethnic groups seemed to be associated with students' income levels. As income levels increased for African American and Hispanic students, so did graduation levels.

In a study of community colleges with a high percentage of Latino/a students, Pina (2005) found that financial packages that included grants and work-study were the most effective in terms of student retention. However, a variety of other factors seemed to influence the effect of financial aid on whether students continued in college. These variables included age and gender but not ethnicity.

Work performed by Nora, Barlow, and Crisp (2006) provided a deeper understanding of the influence aid has on access, engagement, and degree attainment. African American, Hispanic, Asian, and non-Hispanic White students were included in the study. Their findings indicated that over the years, first generation and non-first generation students received different amounts of aid (see Table 3). Over the five years, grant and scholarship money declined each year. Loans, however, increased in terms of actual dollars as well as the percentage of aid received by all students groups.

In addition, Nora et al. (2006) evaluated the data in relationship to persistence and the type of aid received each year (see Table 4). The researchers noted that students who did not return to higher education had a greater percentage of their aid derived from loans than did the students who returned. The researchers thought that this might be due to a fear of greater debt without return on their investment. Thus, students who continued may have calculated that by attaining their degrees, they would have more money to pay back their debt.

In this study, persistence was not calculated for each racial/ethnic group. However, the amount of financial aid was categorized as non-Hispanic White, Hispanic, African American, and Asian/Pacific Islander. Hispanic students were given higher levels of grant/scholarship aid during 2002-2003 than any of the other student groups. However, these students took out the fewest number of loans. Non-Hispanic White students had the fewest dollars earned through work-study, followed by Hispanic students.

Table 3

Types of Aid and Persistence of All Student Groups (Adapted From Nora et al., 2006)

Financial factors by category	Average amount received in U.S. dollars/corresponding percentage					
	97-98	98-99	99-00	00-01	01-02	02-03
Grants/scholarships^a						
First gen.	2,437 / 67.6	2,569 / 67.0	2,723 / 54.0	2,795 / 47.3	3,969 / 40.1	2,534 / 36.8
Non-first gen.	2,478 / 54.6	2,317 / 50.7	2,535 / 39.8	2,957 / 33.1	3,014 / 32.7	2,767 / 22.0
Student loans^b						
First gen.	2,601 / 31.3	2,855 / 31.3	3,787 / 44.9	4,745 / 52.3	4,630 / 59.9	5,440 / 60.7
Non-first gen.	8,212 / 44.5	2,924 / 47.6	4,029 / 58.9	4,909 / 66.4	5,188 / 65.4	6,348 / 69.2
Work-Study						
First gen.	1,615 / 0.9	1,932 / 1.7	1,814 / 1.1	2,331 / 0.4	2,073 / 0.0	2,017 / 2.6
Non-first gen.	1,523 / 0.9	1,786 / 1.6	1,792 / 1.4	2,069 / 0.5	2,298 / 1.9	2,259 / 8.9

^aGrants and scholarships represent a sum total in three major grant and scholarship categories (e.g., Pell and state grants).

^bLoans represent a sum total in all of the major loan categories (e.g., Stafford and Perkins loans).

Table 4

Student Persistence by Year and Type of Aid (Adapted From Nora et al., 2006)

Financial factors by category	Average amount received in U.S. dollars/corresponding percentage					
	97-98	98-99	99-00	00-01	01-02	02-03
Grants/scholarships^a						
Persisted	2,556 / 60.4	2,473 / 57.3	2,680 / 47.2	2,977 / 39.0	3,115 / 34.3	2,541 / 22.2
Did not persist	2,118 / 56.1	2,195 / 55.4	2,157 / 33.3	2,575 / 36.8	2,848 / 37.0	2,715 / 28.0
Student loans^b						
Persisted	2,838 / 38.7	3,020 / 40.9	4,050 / 51.5	4,978 / 60.6	5,556 / 64.2	4,459 / 71.7
Did not persist	2,474 / 42.8	2,489 / 43.0	3,418 / 65.7	4,380 / 62.5	4,303 / 62.1	6,319 / 65.4
Work-study						
Persisted	1,619 / 0.9	1,857 / 1.8	1,778 / 1.3	2,191 / 0.4	2,348 / 1.5	2,068 / 6.7
Did not persist	1,300 / 0.7	1,722 / 1.1	2,000 / 1.0	1,961 / 0.7	1,974 / 0.9	2,234 / 6.6

^aGrants and scholarships represent a sum total in three major grant and scholarship categories (e.g., Pell and state grants). ^bLoans represent a sum total in all of the major loan categories (e.g., Stafford and Perkins loans).

From this work, Nora et al. (2006) concluded that student debt was a problem in the United States. Nora supported taking steps to reduce loans while increasing the amount of grant money provided to students. He posited that by reducing the financial burden on students, graduation rates would increase and graduates would be better able to afford to repay the debt that they accrued while in college.

Summary of Retention, Graduation Rates, and Financial Aid

Research findings provide information about financial aid packaging and student success (defined as retention and graduation rates). Given the continued rise in tuition

and fees, this information has been very important to student success. Numerous researchers have examined this issue, but conflicting results have led to some confusion regarding how the types of aid influence graduation rates. Even though study conclusions have been plentiful, and often contradictory, it is important that educators, politicians, and administrators strive to understand how student financial aid influences degree attainment. This is particularly important for students from low-income families (Wilkerson, 2005). A summary of the research findings reported in the last two chapter sections is included in Appendix I.

Unfortunately, financial aid research findings remain inconclusive due to the many variables involved in student retention and graduation rates. As a result, additional research is needed in order to better understand how financial aid packaging affects students (Dowd & Coury, 2006).

Study Institutions

Although HSIs and HBCUs have been established for many years, there has been a lack of understanding of the functions of these two types of institutions in meeting the needs of students (Dayton, Gonzalez-Vasquez, Martinez, & Plum, 2004; Laden, 2004). This is unfortunate because these institutions have served a unique role in educating minority and non-minority students and are an important part of higher education system in the United States (Merisotis & McCarthy, 2005). The following section includes information on HSIs and HBCUs that will elucidate their purposes and histories.

Hispanic Serving Institutions

Although there have been unique obstacles that Latino/a students face in completing higher education degrees, there is hope for increased access and also graduation rates for students in the future (Merisotis & McCarthy, 2005). Part of the optimism has been due to the creation and expansion of Hispanic Serving Institutions. These institutions have had an exceptional ability to support the needs of students from pre-admission through graduation (Laden, 2004).

The Higher Education Act of 1998 has defined HSIs as degree-granting institutions that have support through public or private funding. In addition, Latino/a students must make up at least 25% of the full-time equivalent student enrollment (Santiago & Brown, 2004).

Historical Perspective

Unlike historically black institutions, HSIs were not founded specifically to serve Latino/a students but were institutions that, due to their large number of Latino/a students, became affiliates in order to promote student success (Dayton et al., 2004). The HSI movement began in the late 1970s with the founding of the Hispanic Association of Colleges and Universities (HACU).

Following the HACU founding, funding to support HSIs was initially established through the Higher Education Acts (HEA) of 1992 and 1998 and has increased over the years (Merisotis & McCarthy, 2005). In 2006, more than \$90 million was awarded to HSIs through Title V of the HEA. In addition, the Kellogg Foundation and other organizations have provided millions of dollars to promote education at HSIs (Dayton et al., 2004).

Current Status of HSIs

The purpose of HSIs has been to meet the needs of Latino/a students by providing community atmosphere, having role models available, assisting with financial aid, directing recruitment efforts towards Latino/a youth, and supporting students through remediation (Dayton et al., 2004; Flores, Horn, & Crisp, 2006). In addition, the Latino/a faculty and staff have been able to provide the rest of the campus insight as to the needs of this group of students. By doing this, policies and procedures are established that promote access and student retention (Dayton et al., 2004).

At the time of the present research, there were 216 HSIs including 31 in Puerto Rico. The majority of institutions were community colleges located within urban settings (HACU, 2005), and more than one-half million Latino/a students were currently being educated at HSIs (Santiago, 2006). Almost half of all HSIs were located in California and Texas. (Merisotis & McCarthy, 2005). The numbers of HSIs and students attending them have grown (Stearns et al., 2002). Both the number of HSIs and students educated at these institutions was expected to continue to increase during the first decade of the 21st century (Laden, 2004; Merisotis & McCarthy, 2005).

Summary

HSIs have only been officially recognized since 1998. Over the last two decades, HSIs have increased in number of institutions and students served at these two and four-year institutions. Part of their success lies in a commitment to creating an inclusive environment.

Historically Black Colleges and Universities

Historically Black Colleges and Universities (HBCUs) were initially established to provide for the postsecondary educational needs of African Americans. The first institution was Cheyney State University in Pennsylvania (Evans, Evans, & Evans, 2002), which was established in 1837. Others followed including Wilberforce University (1856), Bowie State University (1865), Lincoln University in Missouri (1866), and Howard University (1867). Many others were founded around the turn of the 19th century due to funding provided by the Morrill Act of 1890 (Evans et al., 2002).

To be designated as an HBCU, institutions needed to meet several criteria. One essential requirement was that each institution's principle purpose was the education of African American students. Colleges and universities also needed to be accredited or working for accreditation in 1965 and to have been established prior to 1964 in order to be covered under the Higher Education Act of 1965 (U.S. Depart. of Education, 2006).

At the beginning of the 21st century, there were more than 100 private and public HBCUs operating in the United States (Evans et al., 2002). Eleven were two-year public, not-for-profit institutions and 39 were public, not-for-profit four-year institutions. Most of these institutions were relatively small in terms of undergraduate, full-time FTE (U.S. Department of Education, 2006). Still, approximately 24% of all bachelors' degrees earned by African Americans were awarded at HBCUs, and many offered graduate and professional degrees in a variety of programs (Jackson, 2002).

The goals and purposes of these institutions have changed over the years (Evans et al., 2002). The central purpose of providing excellence in education at an affordable price for African Americans has continued. Funding to assist HBCUs in meeting their goals

has come from a variety of sources. Title III was enacted in part to provide additional funds to institutions that serve disadvantaged students. Title III money to fund projects was initially received by HBCUs during the Carter administration. In 2005, the federal money allocated to HBCUs was nearly \$240 million (U.S. Department of Education, 2006). In addition, The Environmental Protection Agency, National Institute of Health, and National Science Foundation, along with other state and private funding sources, have provided additional resources to assist young people in obtaining a high quality education (Evans et al.).

Even with the additional funds, many HBCUs have struggled financially (Kim & Conrad, 2006). Economic issues at the beginning of the 21st century have related to aging facilities, lack of large sufficient endowments, lower faculty salaries, and lower tuitions than many traditionally White institutions. Despite financial constraints, HBCUs have had higher student-faculty ratios and more student-faculty interactions than have PWIs. Thus, HBCUs have been able to use funding wisely in order to support the needs of African American students (Kim & Conrad; Merisotis & McCarthy, 2005).

Summary

HBCUs have comprised a small percentage of the United States' colleges and universities, but they have been a very productive part of the educational system. Although they have struggled due to financial constraints, HBCUs have been able to provide many African-American citizens the support needed to obtain degrees.

Summary

From current research and theory about student financial aid and student success, as

defined by retention and graduation rates, several themes have emerged. First, there has been a connection between the environment and students' decisions to stay or leave higher education (Nora, 2004). This need for inclusion has caused many campus leaders to focus on how they can improve the sense of belonging at their institutions (Pike et al., 2006). HSIs and HBCUs have been able to provide their students with a sense of belonging not possible at other institutions. The awareness of and intervention to promote feelings of inclusion may explain why there has been an increase in graduation rates over the last several years (Williford & Schaller, 2005) particularly at HSIs. However, no clear reasons for increases or decreases in graduation rates were evident in this literature review.

Another theme in the literature was that higher education is becoming less affordable (Perna, 2006). In the past, it was easier for low-income students to attend higher education because of state and federal need-based programs. Students from all income brackets increasingly have been expected to pay for much of their education themselves and incur substantial debt in order to finance their education (Heller, 2004). One of the reasons for this is that need-based aid has been declining while merit-based aid has increased (Wilkerson, 2005). It is unclear how these current changes in financial aid will influence future student graduation rates.

A third theme identified was that diverse racial/ethnic groups react to financial aid differently (St. John, 2006; St. John, Paulsen, & Carter, 2005). Latino/a students, in particular, have been reluctant to take on debt but seem to be aided by grant awards. African American students, however, have not been as reluctant to use loan money to finance their education. Researchers have begun to look at the differences in aid, and

some correlation with retention has been done (Below, 2003; Nora, Barlow, and Crisp, 2006). Results, though, have been inconclusive; and more study in the area of financial aid and graduation rates is needed to develop a clearer understanding of the variables that influence whether students complete degrees (Gansemer & Schuh, 2006).

A final theme was the increase in the numbers of students served by HSIs and HBCUs. More students have been selecting these two types of institutions than ever before, yet little is known about how they benefit students (Pascarella & Terenzini, 2005). In addition, no research has been conducted to identify trends in financial aid and to compare student aid and graduation rates at these types of institutions.

As such, the present research was conducted to fill the gap in the literature by identifying the relationships between financial aid and graduation rates at HBCUs, HSIs, neither HSIs nor HBCUs that serve a high percentage of minority students, and predominantly White institutions. In using a macro perspective approach to studying these types of institutions, a general understanding of and additional insights into the behaviors of students could be gained.

CHAPTER 3

METHODOLOGY

The purpose of this chapter was to describe the statistical analyses of Integrated Postsecondary Data System (IPEDS) data used in order to answer the six research questions. In the following pages, a description of issues that researchers need to consider when using secondary data was included. This was followed by the research questions, more detailed information about the IPEDS data source, the process utilized in selecting study institutions, and statistical procedures used in the analyzing the questions. A summary was provided at the end of the chapter.

Secondary Data Considerations

Hofferth (2005) reported that there are advantages and disadvantages to performing research using secondary data collected from large scale databases. Some positive aspects of conducting research using secondary data are cost savings, access to large sample sizes, and the ability to draw data from a variety of sources. However, there are problems with secondary research analysis. One of the major disadvantages associated with secondary data has been the uncertainty of the data accuracy, as the data may be collected or compiled from unreliable or inconsistent sources. Limited budgets and poor decisions on data collection methods can reduce the validity of the data (Hofferth, 2005). In

addition, information inputted into databases is difficult to track and can be misinterpreted (Lusigan, Metsemakers, Houwink, Gunnarsdottir, & Van Der Lei, 2006). As a result, accessed data can lack validity.

Before a study begins, investigators must weigh the costs and benefits of database use (Hofferth, 2005). Only after careful consideration should researchers decide whether to use the collected data in a research project (Hofferth; Lusignan et al., 2006). In the current project, the benefits of using secondary data were determined to outweigh the costs, and a decision was made to use the data.

Introduction to the Data Source and Research Purposes

The intent of this research project was to analyze existing quantitative data collected by the National Center for Education Statistics from institutions of higher education. More specifically, the data from the Integrated Postsecondary Data System (IPEDS) were used to reveal the trends and relationships that existed between student financial aid and graduation rates in different higher education institutions.

The purposes of the research project were achieved through applying a variety of methodologies to extracted datasets. The statistical methods used included descriptive statistics, regression analyses, and analyses of variance (ANOVA). The research questions and the corresponding analyses are presented and discussed in the following sections.

Research Questions

The following five research questions were used to guide this research.

Research Question 1: What were the trends in graduation rates of students between 1999 and 2005 at four-year, public Hispanic Serving Institutions (HSIs), Historically Black Colleges and Universities (HBCUs), neither designated HSIs nor HBCUs institutions that serve high (25% or higher) populations of minority students (HMSIs), and Predominantly White Institutions (PWIs)?

Research Question 2: What were the trends in financial aid (average federal grant aid, average amount of state/local grants, average amount of institution based grants, and average amount of loans) received by students between 1999 and 2005 at four-year, public HSIs, HBCUs, HMSIs, and PWIs?

Research Question 3: Were there significant differences between the graduation rates of all first-time, full-time students in 2005 at four-year, public HSIs, HBCUs, HMSIs, and PWIs?

Research Question 4: Were there significant differences between the types of financial aid made available to students during 2005 at four-year, public HSIs, HBCUs, HMSIs, and PWIs?

Research Question 5: Were specific combinations of financial aid (average federal grant aid, average amount of state/local grants, average amount of institution based grants, and average amount of loans) received by students in 1999 and regional location significantly associated with 2005 graduation rates at four-year, public HSIs, HBCUs, HMSIs, and PWIs?

Data Source

The data for this project were extracted from a National Center for Education Statistics (NCES) databases. The NCES was established by the United States Department

of Education to gather and disseminate a wide range of educational data. The NCES collects and stores data from both public and private higher education institutions throughout the United States (NCES, 2007). The data used in this study were provided by higher education institutions and state agencies to the NCES and stored within the Integrated Postsecondary Education Data System (IPEDS). Access to the IPEDS database provides opportunities to gather a wide range of data that could be analyzed and examined to inform and assist administrators, politicians, and other policy makers in decision-making and planning (NCES, 2007).

The data used in this study were acquired from the searchable IPEDS website database (<http://nces.ed.gov/ipeds>). The website allows researchers to obtain desired data through menu driven queries. The IPEDS database contains aggregated information compiled from data provided by higher education institutions. The data were collected from U.S. higher educational institutions through self-report. Institutions compile the needed data and submit it into the database. The database directors do not verify the accuracy of the data.

The IPEDS data collected for this study did not include individual student data. The information extracted from the IPEDS database was used to gain an understanding of student trends and performance from an institutional perspective while maintaining student anonymity.

All of the institutions selected for this study were four-year, public institutions that granted bachelor's degrees. The rationale for using four-year, public colleges and universities was to ensure some comparability in tuition pricing. Costs are important to student need determination and thus to need-based awards. By using four-year public

institutions, there was some control placed on the costs associated with student financial need. Tuition levels and fees were more similar when only public schools were considered than if the study had included private schools as well.

To determine the relationship of institution type with the variables, the colleges and universities were classified into one of four subgroups: Hispanic Serving Institution, Historically Black College and University, High Minority Serving Institution, or Predominantly White Institution.

All four-year, public HSI and HBCU designations were determined according to the institution status in 1999. The HSIs and HBCUs were further qualified as degree-granting, four-year public universities, and offered a variety of areas of study and degree opportunities (see Appendices II and III). The HMSIs and PWIs were selected through a matching process constructed to assure that these comparison institutions were similar to the study HSIs and HBCUs. This selection process reduced the number of confounding variables associated with conducting secondary research discussed above. A description is presented below of the matching process and decision making criteria.

Choosing Institutions

This study focused on the comparison of four types of institutions. Thus, the inclusion of all the colleges and universities in the IPEDS database was not appropriate because many of these institutions did not meet the HSI or HBCU criteria nor did they qualify for inclusion into the comparison groups. For example, non-degree-granting, private, or specialized institutions as defined by the 2000 Carnegie classification, were not included in this study. All institutions that were HBCUs and HSIs in 1999 and met the criteria of being public, four-year degree granting, non-specialized institutions were included in the

research project (see Appendix II for HBCUs and Appendix III for HSIs). A set of matching institutions with low minority populations made up of predominantly White students and a set of institutions that served high populations of minorities were also selected for investigation (see Table 5). These institutions served as matching institutions, with HSIs and HBCUs. The intent was to find a comparable, matching HMSI and PWI for each HSI and HBCU listed in Appendices II and III.

Table 5

Designated Groups

Institution group	Designated name of the group
Hispanic Serving Institution	HSIs
Historically Black College or University	HBCUs
High Minority Serving Institutions	HMSIs
Predominantly White Institutions	PWIs

The matching process incorporated the analysis of four criteria intended to match the HBCUs and HSIs with comparable PWI and HMSI institutions. By having comparison groups, there was reduction in the confounding variables that may be associated with this method of research.

Before the process for matching institutions was developed, the literature and research were reviewed. From the review, it was determined that graduation rates were influenced by the state in which the institutions were located (Pascarella & Terenzini, 2005). In addition, the review exposed institution purpose or mission as an important factor. Institutional purpose was defined by (a) the 2000 Carnegie classification

(Hamrick, Schuh, & Shelley, 2004), (b) the percentage of students living on campus (Strauss & Volkwein, 2004; Torres, 2006), and (c) the average dollar amount spent per FTE student by the college or university on student services (Pascarella & Terenzini, 2005).

Further, the literature review produced evidence indicating that state rules, regulations, and funding influenced graduation rates (Pascarella & Terenzini, 2005). As a result, the state in which the HSIs and HBCUs were located was considered an important criterion for matching the HSIs and HBCUs with both HMSIs and PWIs. Using the literature as a guide along with the identified influential variables above, a procedure was created for matching HMSIs and PWIs to the corresponding HSIs and HBCUs within the same state. For each HSI in Texas, a PWI and HMSI was found within Texas as a possible match. There were a few states in which a PWI or HMSI could not be determined to adequately match the HIS or HBCU found within the state. In Delaware, a PWI match for Delaware State University (a HBCU) was found, but there was no four year, public HMSI in that state. So, no HMSI was included in the study for Delaware State University.

The matching process and application of matching criteria involved two stages, each with several steps. All steps taken in the matching process utilized 2005 data extracted from the IPEDS database. In the first stage, all HSI, HBCU, HMSIs, and PWIs were identified by state. This stage also involved the extraction of the institutional data from the IPEDS database that included the Carnegie category, the percentage of students living on campus, and the dollar amount spent per FTE on student services. This extraction was performed for all selected institutions for possible inclusion into the research dataset.

These variables were examined in the second stage as efforts were made to match HSIs and HBCUs with PWIs and HMSIs with correspondingly similar characteristics. The stages and steps applied for selecting appropriate matching institutions are listed below. To further communicate the process, a schematic of application of criteria was developed (see Figure 8).

The steps taken in the first stage were:

Step 1. All states with public, four-year HSIs and/or HBCUs, qualifying institutions were identified and selected.

Step 2. All public, four-year HMSIs or PWIs, in all states with qualifying HSIs or HBCUs, were identified and selected.

Step 3. The 2000 Carnegie classification was determined and coded for all selected institutions. Classifications were coded as follows: 1 = research extensive, 2 = research intensive, 3 = master's, 4 = bachelor's liberal arts, or 5 = bachelor's general.

Step 4. The percentage of students who lived on-campus and the dollar amount spent per student on student services at each of the HSIs, HBCUs, HMSIs and PWIs selected for preliminary matching were identified and extracted for the list of institutions.

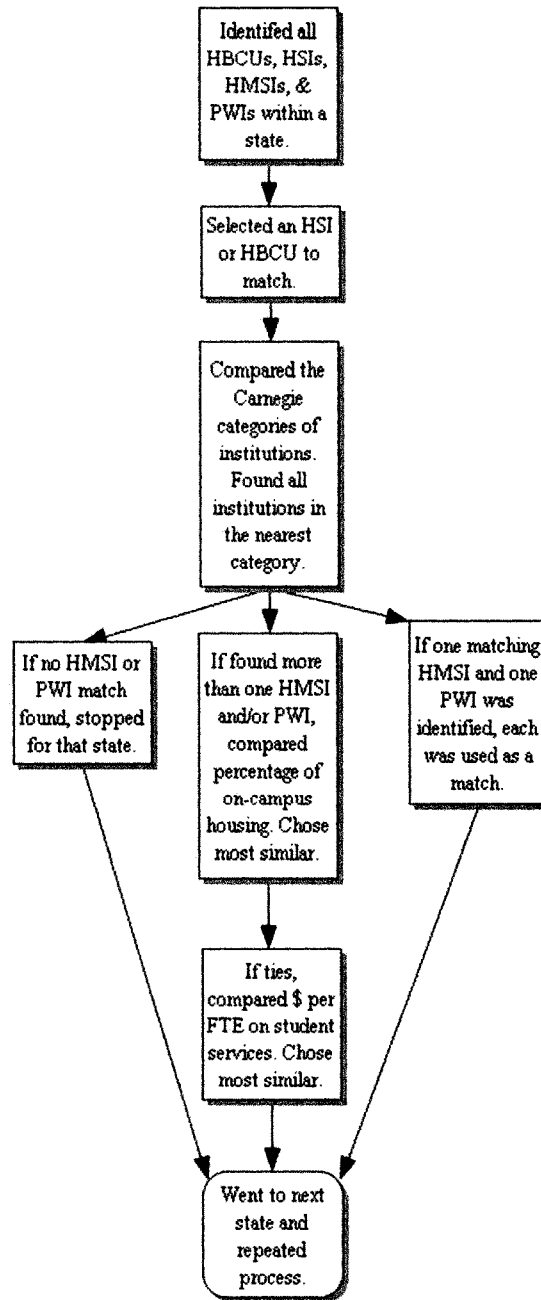


Figure 8. Schematic of institution-matching process for HSIs and HBCUs with HMSIs and PWIs.

Once a pool of viable study institutions was identified from the IPEDS database, a second stage of selection took place to establish groups of HSIs, HBCUs, and

correspondingly matched PWIs and HMSIs. The determination of appropriate institutions for inclusion in the final dataset required the comparison of institution data extracted from IPEDS in the first stage of the matching process. Thus, in the second stage using several criteria, there was an additional attempt to match each HSI and HBCU with a correspondingly similar HMSI and PWI. The matching criteria used in the second stage included (a) the 2000 Carnegie classification, (b) the number of students living on campus, and (c) the dollar amount spent per full-time student on student services. The institutions with the closest matching values were selected for inclusion in the final dataset.

The steps taken in the second stage were:

Step 1. Match the 2000 Carnegie classification values for the selected HSIs and HBCUs and the targeted PWIs and HMSIs for each group of state delineated institutions. There were four possible outcomes to the application of the 2000 Carnegie classification criteria:

- A. There were no matching HMSIs or PWIs because there were no public, four-year institutions that existed or were not already matched with another HSI or HBCU in that state. Even though a match was not found, the HSI or HBCU was included in the study;
- B. There was only one matching HMSI or PWI, and that matching institution was selected;
- C. There were appropriate HMSI and PWI matches, and both of the matching institutions were selected;
- D. The application of the criterion resulted in multiple HMSI and/or PWI matches.

Therefore, a second matching criterion was applied to identify the institution(s) to be used (Step 2).

Step 2. If multiple institutions were matched through the application of 2000 Carnegie classification criterion, the percentage of students that lived on-campus in 2005 was applied as a secondary matching criterion. Those institutions with the closest match in this criterion were selected. In the event of multiple matches, a third matching criterion was utilized (*Step 3*).

Step 3. If multiple institutions were matched through the application of 2000 Carnegie classification and the number of students living on-campus criterion, a third criterion was utilized. This criterion was applied to determine which HMSI and/or PWI had the closest amount spent on student services. Those institutions with the closest match in this criterion were selected within each state.

Step 4. The process was repeated for each HSI and HBCU, by state.

Certain states did not have four-year, public, degree-granting, non-specialized institutions that could be compared to an HBCU or HSI using the matching criteria (see Appendix III). As a result, there were unequal numbers of matches for the HSIs and HBCUs (see Table 6).

Though finding matching HMSI and PWI for each HBCU and HIS was not possible, a representative sample was compiled. The sample was determined to be of sufficient size to provide the statistical power necessary to reduce error to an acceptable level at a significance of .05 (Hinkle, Wiersma, & Jurs, 1998).

Table 6

Study Group Numbers

Institution group	Number of institutions
HSIs	29
HBCUs	39
HMSIs	51
PWIs	52

Coding

When the information for each institution was downloaded from IPEDS, it was accompanied by a unique institution code. In addition, individual institutions were classified by state and region. Thus, all institutions included in the study were assigned numeric codes to represent the state in which they were located (see Appendix IV). Regional coding was performed using the IPEDS regional classification system. The IPEDS system includes eight regions of the United States: Far West, Rocky Mountains, Southwest, Plains, Southeast, Great Lakes, Mid-Eastern, and New England. Since the majority of the HBCUs were located in the Southeast and the majority of the HSIs were located in the Southwest and Far West with few institutions in other regions, a decision was made to combine some of the regions (see Table 7). For the purposes of this study, institutions within the Far West, Rocky Mountains, and Southwest were included in the region that contained the states of California, Colorado, New Mexico, Oklahoma, and Texas. This area was designated as *Western* region. The *Eastern* region combined the institutions in the Mid-Eastern and Great Lakes areas and included institutions located in the District of Columbia, Illinois, Maryland, New Jersey, New York, Ohio, and

Pennsylvania. The *Southern* region combined institutions in the Plains and Southeast states. This region included Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. A list of states and the regional designation can be found in Appendix V.

Table 7

Regional Information With Number of States per Region and Coding Used

Region	Number of states	Regional coding
Western (Far West, Rocky Mountains, and Southwest)	5	1
Southern (Plains and Southeast)	12	2
Eastern (Mid-Eastern and Great Lakes)	7	3

Study Variables and Study Overview

In this study, there were five independent variables and one dependent variable. Data for each of the six variables were obtained from the IPEDS database for all students attending each of the four institution types in the study. The five independent variables included in this research are institution average per-student dollar amounts of federal grants, state grants, institution based grants, and loans. The fifth independent variable was created by calculating the sum of the average per student federal grants, state grants, institution based grants, and loans (see Table 8). The one dependent variable was the average institution graduation rate in 2005.

In addition to the variables associated with institution type, financial aid, and graduation rates, the study institutions were identified by geographic location. The

possibility of geographic influences on financial aid and graduation variables justified the inclusion of the data. Two dummy variables were used to designate geography for each institution. For the first dummy code, GeoDumCod_1, all institutions within the southern region of the United States were coded with a “1” and institutions in the east and west were coded with a “0.”

Table 8

Study Independent and Dependent Variables

Independent variables (measured at the institution level)	Dependent variable (measured at the institution level)
1. Average amount of federal grants in 1999	1. Average Graduation Rate in 2005
2. Average amounts of state/local grants in 1999	
3. Average amounts of institution-based aid in 1999	
4. Average amount of loans in 1999	
5. Sum of the average amounts of (1) federal grants, (2) state grants, (3) institution-based grants, and (4) loans ($5 = 1 + 2 + 3 + 4$) in 1999	

The second dummy variable, GeoDumCod_2, was used to identify whether being located in the “west” was an influencing factor (see Appendix V). Thus, for GeoDumCod_2, all institutions located in the Western region were coded with a score of “1” and institutions in the Eastern and Southern regions were coded with a score “0.” Indirectly, the influence of being located in the Eastern region of the U.S. was assessed using the two dummy variables. The institutions in the Eastern region were identified through the coding of (0, 0) of the two other dummy variables. This justifies the

development of two dummy variables for the three nominal geographic variables (Hinkle, Wiersma, & Jurs, 1998).

Data Downloading

Two sets of data were downloaded from the IPEDS database. The first dataset contained information needed in order to choose comparison institutions including: (a) 2000 Carnegie classification, (b) percentage of students living on-campus in 2005, and (c) dollar amount spent per FTE on student services in 2005. Once the targeted institutions were identified and selected, a second set of IPEDS data was downloaded. The second set contained all the data regarding the dependent and independent variables corresponding to the study institutions.

Data Conditioning

Prior to analysis, the data files were examined for accuracy. This was completed in two steps. The first step involved the visual inspection of the data for missing or abnormal values. After the visual inspection was completed, the second step involved calculating the descriptive statistics of all variables using SPSS, Version 14. For each variable, the means, minimums, maximums, and standard deviations were derived. The calculated numbers were then compared for consistency to the summary data for each provided by the National Center for Educational Statistics. This allowed for the identification of outliers. When possible, omitted or anomalous data were replaced by accurate values retrieved directly from the websites of institutions. If accurate data were not attainable or available, a note was made in a log. Small amounts of missing data were coded as “-1” in the dataset so that when analysis was conducted using SPSS, modification could be made to ensure that these values were excluded from the

calculations. This enabled *pairwise* use of data. If significant amounts of data were missing, an alternative institution containing more complete information was selected from the database as a replacement.

Data Analysis

This description of data analysis includes an explanation of the methodology used in the analysis performed for each of the five research questions. All data analyses were conducted using SPSS. Unless stated otherwise, all determinations of significance were completed at the .05 level. A summary of the analysis process is provided at the end of this section to further communicate the methods and procedures utilized in this research project.

Research Question 1: What were the trends in graduation rates of students between 1999 and 2005 at four-year, public Hispanic Serving Institutions (HSIs), Historically Black Colleges and Universities (HBCUs), neither HSIs nor HBCUs that serve high (25% or higher) populations of minority students (HMSIs), and Predominantly White Institutions (PWIs)?

The purpose in asking this question was to examine trends in graduation that were representative of each institution group. To achieve this purpose, the graduation rates of the four institution groups were examined and compared over the six-year period from 1999 to 2005 for discernable changes. This analysis involved the calculation of the average institution graduation rate at each of institution types for each of the study years.

The determination of trends was developed through a comparison of means over the six-year time period. Additional calculations were performed to evaluate trends. For each

group of institutions, the mean graduation rate in 1999 was subtracted from the graduation rate in 2005 in order to determine the total percent change. In addition, an average percent increase was calculated based on the computed mean values for each institution group. This was accomplished by dividing the total percentage change over the six years by the 1999 graduation rate. By calculating this number for each institution group, it made the comparison between groups easier as one could determine the amount of change as a percentage rather than a raw number.

The interpretation and subsequent explanation of trends in graduation were based on the overall increase in graduation and the percent increase from 1999 to 2005, except for the year 2002, since the data for this year were not included in the IPEDS database. The institution groups and statistical method used in this study are displayed in Table 9.

Research Question 2: What were trends in financial aid (average federal grant aid, average amount of state/local grants, average amount of institution based grants, and average amount of loans) received by students between 1999 and 2005 at four-year, public HSIs, HBCUs, HMSIs, and PWIs?

Table 9

Data Analysis Procedures for Research Question 1

Group of institution and sample size	Descriptive statistical analysis for years 1999 to 2005
HSIs (N=29)	Mean, percent change, and percent increase of graduation rate calculated and graphed
HBCUs (N=39)	Mean, percent change, and percent increase of graduation rate calculated and graphed
HMSIs (N=49)	Mean, percent change, and percent increase of graduation rate calculated and graphed
PWIs (N=55)	Mean, percent change, and percent increase of graduation rate calculated and graphed

The purpose in asking this question was to examine trends in financial aid that were representative of the four institution groups. The types of financial aid examined included: (a) the average per-student federal grant aid, (b) the average per-student amount of state/local grants, (c) the average per-student amount of institution based grants, (d) the average per-student amount of loans, and (e) the total average amount of aid per student calculated by adding the first four variables together.

The average for each of the four aid types was calculated and examined for each year from 1999 through 2005, for each of the study institution groups (HSI, HBCU, PWIs, and HMSIs). The total average amount of each type of aid for all institutions was calculated, even though this figure was not directly addressed in the research question. This value was needed, however, in order to establish a reference point for comparison. The average financial aid results for each type of aid for each of the institution types and for all groups were included in tables and displayed in figures. The results were then examined to

determine the trends in the aid types for each of the four institution groups over a six year period from 1999 to 2005.

In order to determine the average amount of change for each type of aid, the average federal aid, state aid, institution-based grant aid, and loans received in 1999 at each group of institutions was subtracted from the average amount received in 2005. This calculation provided additional information regarding trends in each type of aid over the six years at each of the institution types.

One final calculation, the percent change, was deemed necessary in order to determine trends in financial aid in the institution types. The percent change was calculated by dividing the average amount of change for each institution type (as calculated above) by the amount of aid awarded in 1999 for each type of financial aid for each institution type (see Table 10). This calculation, along with the average amount change, was reported in a table.

Table 10

Data Analysis Procedures for Research Question 2

Institution type	Statistical analysis for 1999 through 2005
HSIs	Mean, percent increase, and percent change for each financial aid variable
HBCUs	Mean, percent increase, and percent change for each financial aid variable
HMSIs	Mean, percent increase, and percent change for each financial aid variable
PWIs	Mean, percent increase, and percent change for each financial aid variable

Research Question 3: Were there significant differences between the graduation rates of all first-time, full-time students in 2005 at four-year, public HSIs, HBCUs, HMSIs, and PWIs?

To answer this question, it was necessary to examine the relationship between graduation rates and types of institutions. The independent variable in this analysis was the institution group and the dependent variable was the 2005 graduation rate.

A one-way ANOVA was performed to determine if there were significant differences in average graduation rates among the four institution groups (see Table 11). In reporting the findings of the ANOVA, degrees of freedom, *F*-values, and *p*-values were included in a table.

Table 11

Comparison of 2005 Graduation Rates by Type of Institution Using ANOVA

	HSIs	HBCUs	HMSIs	PWIs
HSIs	NA	NA	NA	NA
HBCUs	ANOVA	NA	NA	NA
HMSIs	ANOVA	ANOVA	NA	NA
PWIs	ANOVA	ANOVA	ANOVA	NA

In the event of a main effect, it is a common statistical procedure to use post-hoc analyses to determine pairwise differences between groups (Hinkle, Wiersma, & Jurs, 1998). Bonferroni post hoc analysis was performed in this study in order to determine correlations between groups when significant findings were identified with the ANOVA.

In reporting these findings, mean differences, standard errors, and *p*-values were calculated and included in a table.

Research Question 4: Were there significant differences between the types of financial aid received by students during 2005 at four-year, public HSIs, HBCUs, HMSIs, and PWIs?

To answer this question, it was necessary to examine the relationship between the four types of financial aid and four groups of institutions. The independent variable in this analysis was the institution group and the dependent variable was the 2005 financial aid amounts for each type of the four types of financial aid.

Four one-way ANOVAs were performed to determine if there were significant differences in average amounts of the four financial aid types received in 2005 by the four groups. The ANOVAs, degrees of freedom, *F*-values, and *p*-values were reported.

In the event of a main effect, it is a common statistical procedure to apply post hoc analyses to determine pairwise differences between groups (Hinkle et al., 1998). Bonferroni post hoc analysis was performed in this study in order to determine correlations between groups (see Table 12). The mean differences, standard errors, and *p*-values were calculated and reported.

Research Question 5: The fifth and final question asked, “Were specific combinations of financial aid (average federal grant aid, average amount of state/local grants, average amount of institution based grants, and average amount of loans) offered students in 1999 significantly associated with 2005 graduation rates at four-year, public HSIs, HBCUs, HMSIs, and PWIs?”

Table 12

Statistical Analysis Processes for Question 3

	Federal grants	State grants	Institution based grants	Loans
Included HSIs, HBCUs, HMSIs, and PWIs with type of aid	ANOVA	ANOVA	ANOVA	ANOVA
If significant findings identified with ANOVA	Bonferroni post hoc	Bonferroni post hoc	Bonferroni post hoc	Bonferroni post hoc

There were multiple variables associated with determining an answer to this question. The graduation rate in 2005 for each institution group was the single dependent variable being examined in this analysis. The independent variables included all financial aid data reported in 1999. The variables were the amounts of four different financial aid types: federal grants, state grants, institution based grants, and loan amounts. In addition to the financial aid variables, two “dummy” variables were included to provide evidence of regional influences on graduation rates. These were included as independent variables in the analysis process.

Given the form of the research question and the designation of independent and dependent variables, a linear regression analysis was appropriate. Further, the standard regression analysis is well supported as a methodology for determining the amount of influence that two or more independent variables have on a dependent variable (Fraenkle & Wallen, 1996). The underlying assumptions of this research question are the multiple variables influencing graduation rates; therefore, linear regression was an appropriate method for examining these relationships.

The analysis began with the simultaneous inclusion of all independent variables into an equation to determine if there was a significant relationship with graduation rates. The calculation of a single correlation coefficient (r) enabled the determination of strength and direction of the relationships between the independent and dependent variables, which were reported along with the level of significance. The coefficient of determination (r^2) was calculated to determine what percentage of the variation in graduation rates could be attributed to the independent variables. These calculations were reported for each institution group.

As part of the regression, the beta coefficients (B) were calculated and tested for significance (p) using the t -test (t). This is the standard methodology for regression analysis (Hinkle et al., 1998). The beta coefficients allowed for the determination of the relative strength and direction of the relationship between the variables and the contribution of each independent variable toward explaining the variation in graduation rates (Gill, Gonzalez-Rodriguez, Colubi, & Montenegro, 2007).

The overall analysis involved the determination of significant relationship between all the independent variables. The dummy variables and the independent variables were simultaneously included in the regression analysis. The method of regression analysis was used to identify the influence of the independent or dummy variables on the dependent variable. This is a common analysis applied to these forms of data relationships (Pedhazur, 1997). After this initial analysis was completed, it was followed by a more in-depth examination of the relationship of each independent variable to graduation rates in 2005 for each institution group.

Summary of Methodology

The focus of this project was on the trends and associations of HSIs, HBCUs, HMSIs and PWIs. The data collected by NCES and stored in the IPEDS database were used to answer six research questions. The data were organized and conditioned to assure accurate analysis and minimize confounds. Five independent variables and one dependent variable were used in this study. In addition, two dummy variables were included in the analysis to determine if there was a regional location impact on the graduation rates of the study institutions. The correlation coefficient and the standardized beta coefficients were examined to determine the significance of the relationships between the independent variables and the graduation rates in 2005.

Summary

Multiple statistical procedures are used in social science research, including ANOVA and regression analyses, to determine trends and establish relationships between variables (Fraenkel & Wallen, 1996). Each methodology provides evidence of how independent variables influence dependent variables. These and other statistical procedures were utilized in this study to determine trends and relationships between variables. In an effort to provide a concise communication of the methodologies, a summary of the applications of analysis for each research question, along with a table, are presented below.

The first two research questions focused on trends in graduation rates and trends in financial aid of the four institution groups from 1999 to 2005. In answering these questions, descriptive analyses were calculated and the means were examined for each of the study years to determine trends (see Table 13).

Table 13

Summary of Research Questions 1 and 2

Summary of question	Statistical analysis
<i>Research Question 1:</i> What were the trends in graduation rates of students between 1999 and 2005 at the four types of institutions?	Descriptive (means)
<i>Research Question 2:</i> What were trends in financial aid received by students between 1999 and 2005 at the four types of institutions?	Descriptive (means)

The third and fourth questions focused on comparing and contrasting graduation rates and the levels of financial aid of the different groups of institutions. The ANOVA methodology was applied to determine overall effects. When a significant main effect was found, the Bonferroni post hoc analyses to determine pair wise differences were used (see Table 14).

Table 14

Summary of Research Questions 3 and 4

Summary of question	Statistical analysis
<i>Research Question 3:</i> Were there significant differences between the graduation rates of students in 2005 at HSIs, HBCUs, neither HSIs nor HBCUs that serve high populations of minority students, and PWIs?	ANOVA (post hoc if significant main effect detected)
<i>Research Question 4:</i> Were there significant differences between the types of financial aid received by students during 2005 at HSIs, HBCUs, neither HSIs nor HBCUs that serve high populations of minority students, and PWIs?	ANOVA (post hoc if significant main effect detected)

The fifth and final question was answered using a regression analysis in order to determine the total influence each type of financial aid had on graduation rates at the different institutions (see Table 15).

Table 15

Summary of Research Question 5

Summary of question	Statistical analyses
<i>Research Question 5:</i> Were specific combinations of financial aid (average federal grant aid, average amount of state/local grants, average amount of institution based grants, and average amount of loans) received by students in 1999 significantly associated with 2005 graduation rates at the four types of institutions?	Regression with ANOVA

In summary, determining the answers to the study questions required the application of several different types of statistical analysis. Once the statistics were calculated, the evidence was reported and the results were displayed on graphs, charts, and diagrams. Accurately reporting and interpreting the results of the data analysis relies heavily on the justification, selection, and application of appropriate data analysis methods. The decisions made in the selection process were made to ensure that all methods were appropriate and justifiable.

CHAPTER 4

RESULTS

The objectives identified for this research study were to determine trends in financial aid and graduation rates at four different groups of institutions and to identify financial aid factors that influence graduation rates at those institutions. A number of statistical procedures were performed to meet the objectives. Only a small portion of the statistical calculations are presented. The corresponding tables and graphs included display the most pertinent statistical results regarding the trends and factors that influenced graduation rates for institution types included in the study.

In the following pages, statistical information concerning the institutions used in the study is presented in order to provide a framework for understanding the similarities and differences among the four institution groups. This is followed by results that specifically address each of the research questions. The chapter concludes with a summary of the research findings.

Institution Information

A total of 171 institutions were selected for inclusion in this study (see Appendix IV). Specific criteria were used in the selection of the colleges and universities. The groups consisted of HSIs (N = 29), HBCUs (N = 39), HMSIs (N = 68), and PWIs (N = 68).

These four groups varied greatly in many ways. For example, the groups of institutions differed by racial/ethnic student mix. The percentage of minority students for each group is presented in Figure 9. HBCUs had the largest percentage of students that identified themselves as a minority (African American, non-Caucasian Hispanic, Asian, or American Indian).

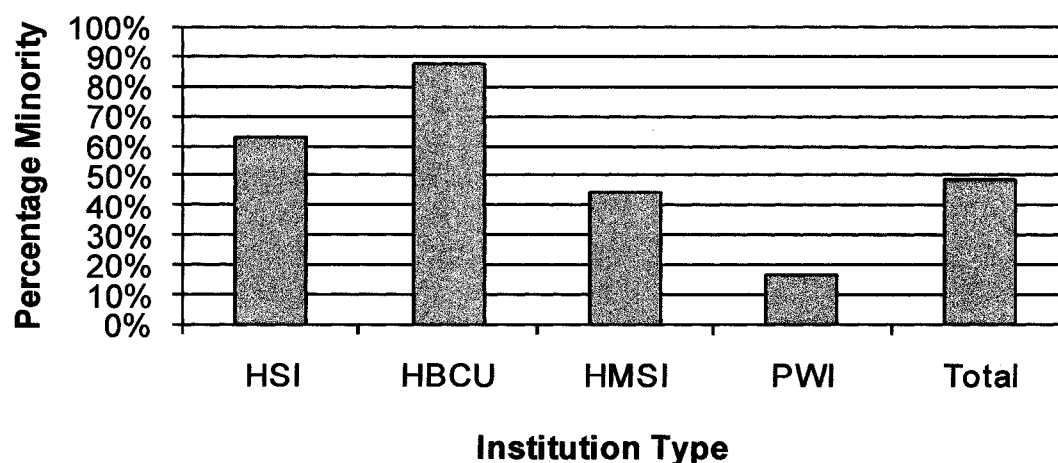


Figure 9. Average percentages of students identified as a minority by institution types in 2005.

The four groups differed in the numbers of first-time students admitted in 2005 (see Table 21). In terms of student body numbers, the HMSIs had the largest, on average, student body with 1,958 first time, full-time students in 2005. The HBCUs, with an average of 870, had the smallest average number of first time, full-time students.

In terms of financial differences, the amount spent on student services was one of the variables considered in the matching process (see Table 16). The HBCUs and PWIs were the most dissimilar, with HBCUs spending nearly \$500 more per student on student services than did PWIs.

Table 16

Characteristics of Institution Types in 2005

Institution type	First-time, full-time students	Average student services expenses per FTE for all students	Percent minority
HSIs	1,577	\$1,021.64	.63
HBCUs	870	\$1,464.57	.88
HMSIs	1,958	\$1,054.08	.44
PWIs	1,774	\$970.96	.17

Differences by State

Average amounts of financial aid provided to students attending the study institutions varied by state (see APPENDIX VII). Students who attended a study institution located within the District of Columbia received the highest level of aid (\$17,000) during the 2004-2005 academic year. By contrast, students attending a study institution in Oklahoma received the lowest level of financial aid. Students attending one of the Oklahoma colleges or universities included in this study received approximately \$9,500 during the 2004-2005 academic year. The average financial aid received per FTE using all graduate and undergraduate students for all institution types included in this study was nearly \$12,000 during the 2004-2005 academic year.

Regional Differences

Another difference between the four groups included in this study was the location of the institutions (see Figure 10). The majority of the HSIs were located in the Western region of the United States, while the majority of the HBCUs were located in the Southern region of the United States.

From Figure 10, it is apparent that there were not equal numbers of matching institutions by geographic regions. This discrepancy in numbers is reflective of the lack of sufficient matches within the various states (see Appendix IV).

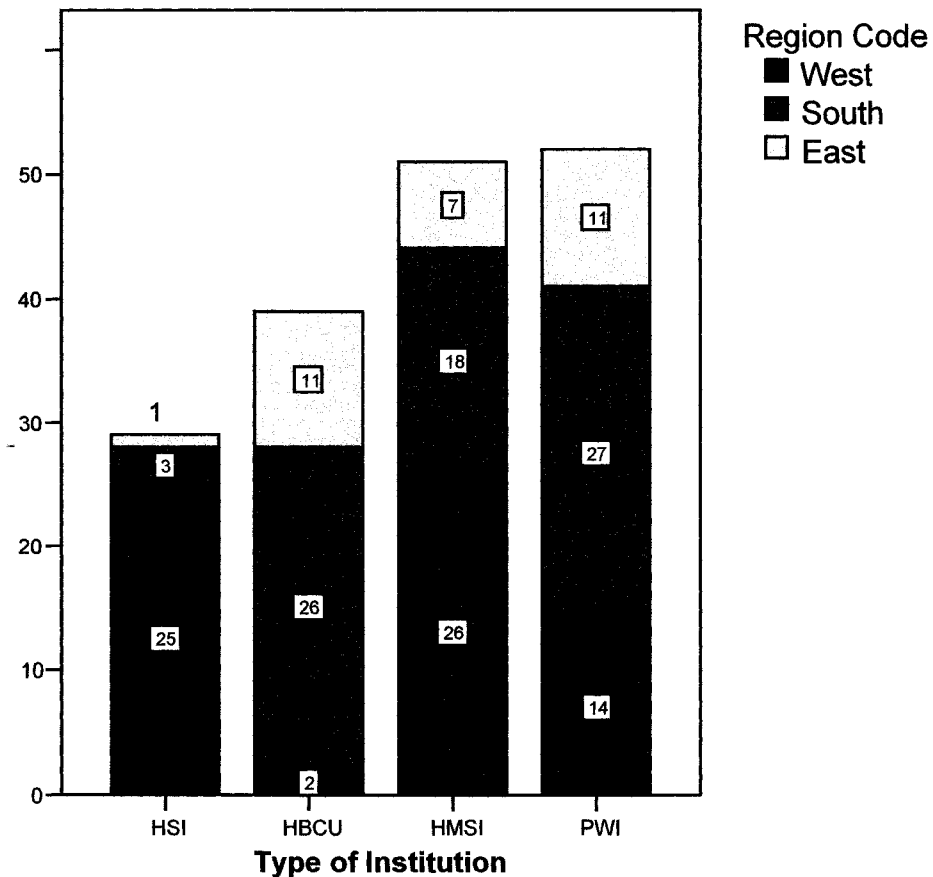


Figure 10. Graph of institution types by regions.

By region, average dollar amounts of financial aid differed to some extent in 2005 (see Figure 11). The average amounts of federal grant aid were very similar among regions with an approximate \$140 variation among the three regions. However, differences in institution grants were substantial. Students enrolled in Western region institutions were awarded on average \$2,520 per year, while students in the Eastern area

of the United States received \$3,733. Students attending institutions in the Southern region received \$2,820 in institution aid. In terms of loans, on average, students in the Eastern region took on approximately \$1,100 more debt during 2005 than students in the West, and about \$900 more than students in the South.

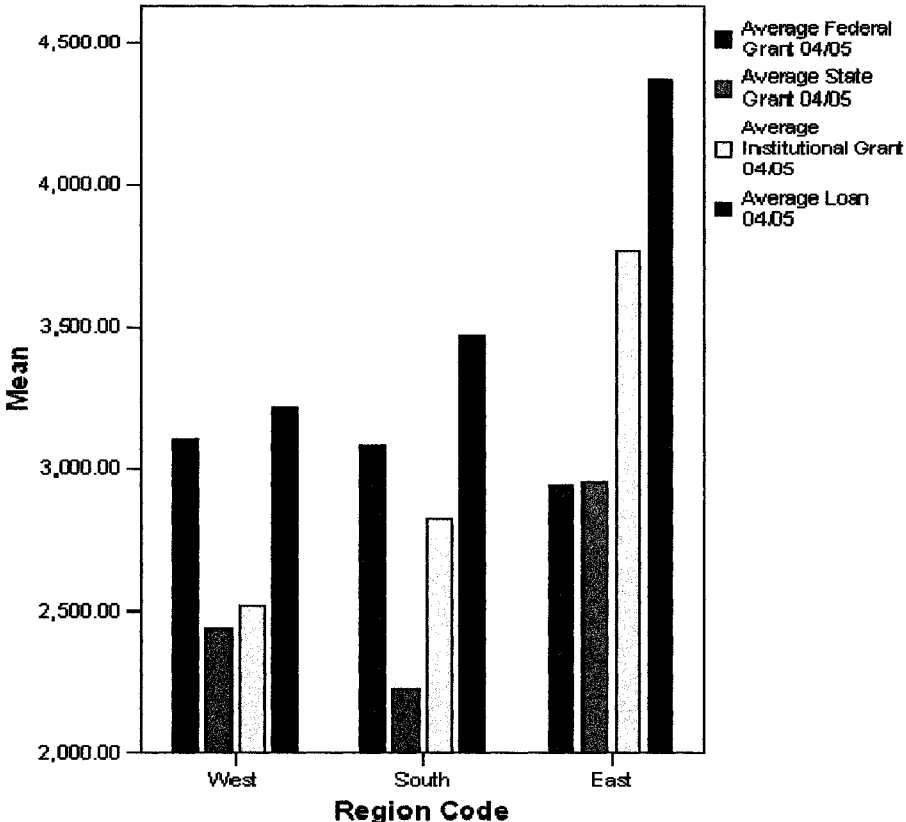


Figure 11. Mean 2005 financial aid dollar amounts by region.

Synopsis of Institution, State, and Regional Characteristics

In summary, the colleges and universities included in this study were fairly diverse in many characteristics. The four groups did vary in ethnic/racial student mix, size, and the amount spent on student services. State and regional variations were also noted.

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Analysis of Study Questions

In the next several pages, the results of the statistical analyses for the six research questions are presented. Tables, figures and accompanying narratives provide brief interpretations of the data analyses. At the end of this section, a summary is provided of the findings.

Trends in Graduation Rate

Research Question 1: What were the trends in graduation rates of students between 1999 and 2005 at Hispanic Serving Institutions (HSIs), Historically Black Colleges and Universities (HBCUs), neither HSIs nor HBCUs that serve high (25% or higher) populations of minority students (HMSIs), and Predominantly White Institutions (PWIs)?

In order to answer this question, descriptive statistics were compiled for the collected institution data. The mean graduation rates for the years 1999 to 2005 were examined to ascertain discernable trends. The results revealed an increase in graduation rates for each of the four institution groups between the years of 1999 and 2005 (see Table 17). An analysis of the compiled overall graduation rates revealed an average rise of nearly 4% between those years.

The greatest increase in graduation rates over the years of 1999 and 2005 was seen in the HSIs, with a 4.96% increase. This value was calculated by subtracting the average graduation in 1999 from the average in 2005. This number was then divided by average graduation rate in 1999 in order to determine the percentage of increase over that time period. These calculations were made in order to make a fairer comparison between groups, as they all began and ended with different graduation rates. The derived numbers are displayed in the “Percent increase” column of Table 17.

Table 17

Trends in Graduation Rates: Percentage of Students Graduating by Institution Type

Institution	1999	2000	2001	2003	2004	2005	Change (2005- 1999)*	Percent increase**
HSIs	29.72	30.07	32.23	32.96	33.93	34.68	4.96	17
HBCUs	31.06	31.36	31.41	33.52	33.97	33.28	2.23	7
HMSIs	40.40	39.80	41.92	42.77	42.65	44.24	3.83	9
PWIs	44.21	44.48	46.68	47.14	47.69	48.83	4.62	10
All institutions	37.60	37.67	39.27	40.33	40.76	41.55	3.96	11

* Calculated by subtracting the 1999 graduation rate from the 2005 graduation rate.

** Calculated by dividing the change in graduation rate by the 1999 graduation rate.

Calculated changes in graduation rates are included in Table 17. Note that the means for 2002 have not been included. This is due to a gap in the IPEDS database, which did not include the graduation rates for the 2001-2002 academic year. Figure 12 provides a visual representation of the upward trend in graduation rates.

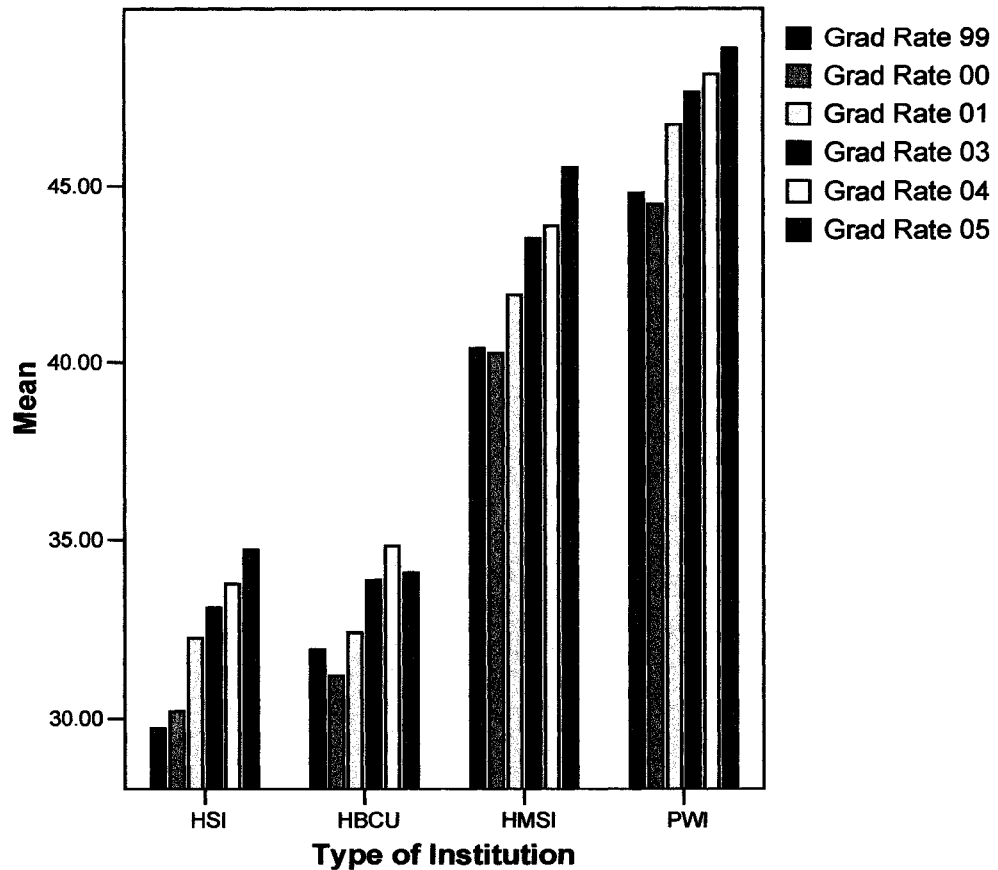


Figure 12. Mean graduation rates by institution types from 1999 through 2005.

In terms of variations between groups, the HBCUs experienced the smallest percentage gain in average graduation rate, with a 2.23% increase. In the case of HBCUs, the percentage change was 7% during this time period. The greatest gain was seen in HSIs with an absolute change of 4.96% resulting in an overall 17% change over those years.

In summary, descriptive statistical analyses of graduation rates revealed an upward trend between the years of 1999 and 2005 for all four institution study groups. Each of the four groups experienced at least a 2% average increase in graduation rates from 1999 to 2005, with increases ranging from 2.23% for HBCUs to 4.96% for HSIs.

Trends in Financial Aid

Research Question 2: What were trends in financial aid (average federal grant aid, average amount of state/local grants, average amount of institution grants, and average amount of loans) received by students between 1999 and 2005 at HSIs, HBCUs, HMSIs, and PWIs?

In order to answer this question, the appropriate data from each of the study institutions were compiled and the associated descriptive statistics were calculated for each of the four groups. Various statistical analyses revealed an upward trend in financial aid received by students for all study groups. However, further statistical calculations exposed significant differences in gains between study groups. The details of the data analyses and the associated results are presented below. A summary of the findings is provided at the end of the data presentation.

Federal Grant Aid

Average federal grant aid received by students increased for all institutions from 1999 to 2005 (see Table 18). The results indicate that PWIs consistently received the least average amount of federal grant aid dollars per student with \$2,036 received in 1999 and \$2,895 received in 2005. HBCUs had the highest average amount, \$2,577, of federal grant money in 1999. However, by the year 2005, they no longer were the highest. HSIs had the highest average amount, \$3,246, awarded of the four types of institutions. HSIs had an average increase of over \$900 per student, while HBCUs only increased by about \$600. The greatest changes between 1999 and 2005 in terms of dollars and percentage increases in federal grant aid awarded were at HMSIs.

Table 18

*Institution Types and Collective Mean Federal Grant Aid Received per Student From
1999-2005 (in Dollars)*

Institution	1999	2000	2001	2002	2003	2004	2005	Change*	Percent increase**
HSIs	2,318	2,316	2,774	2,880	3,050	2,999	3,246	928	40
HBCUs	2,577	2,528	2,669	2,916	3,151	3,156	3,161	584	23
HMSIs	2,141	2,217	2,466	2,719	2,854	2,894	3,072	932	44
PWIs	2,036	2,181	2,356	2,687	2,782	2,890	2,895	859	42
All institutions	2,232	2,294	2,530	2,781	2,933	2,971	3,068	836	37

* Calculated by subtracting federal grants in 1999 from loans in 2005.

** Calculated by dividing the change from 1999 to 2005 by federal grants received in 1999.

In summary, each of the four institution groups did experience a rise in federal grant aid from 1999 to 2005. However, the largest increase was seen at HSIs. This was followed by the HMSIs, PWIs, and HBCUs where the smallest gains were observed.

State Grant Aid

The increases seen in state financial aid were different than those of federal grant aid. An analysis of all institutions produced an average \$928 award increase between 1999 and 2005 in terms of per student state grant aid dollars (see Table 19). The HMSIs started the time period with largest average awards and continued to have the largest average awards through the study time period. The HMSI group had the largest gain in average state grant aid. However, HBCUs had the largest percentage increase in state grant aid between 1999 and 2005.

Differences were seen between states and institution type within states. But, because of the small number of institutions in each state and the unlikelihood of significant

findings being identified, no additional statistical analysis of state grant awards was performed.

Table 19

Institution Types and Collective Mean State Grant Aid Received per Student From 1999-2005 (in Dollars)

Institution	1999	2000	2001	2002	2003	2004	2005	Change*	Percent increase**
HSIs	1,485	1,570	1,726	1,826	1,841	2,031	2,295	810	55
HBCUs	1,309	1,540	1,839	1,783	1,871	2,117	2,181	872	67
HMSIs	1,605	1,817	1,978	2,108	2,230	2,427	2,605	1,000	63
PWIs	1,539	1,907	1,954	2,054	2,133	2,256	2,516	978	64
All institutions	1,502	1,739	1,897	1,970	2,051	2,236	2,429	928	62

*Calculated by subtracting state grants in 1999 from state in 2005.

**Calculated by dividing the change from 1999 to 2005 by state grants received in 1999.

Institution Grant Aid

Changes in the average amounts of institution based grants were dissimilar to those of the federal grant aid and state grant aid. An analysis of all institutions produced an average \$883 increase in per-student institution-based grant aid received between 1999 and 2005 (see Table 20). Average increases in institution grant aid occurred at all four study groups. The HBCUs had the highest awards per student in 1999, with an average grant award of \$2,652, and continued to provide their students with the highest levels of institution based awards through 2005. Even so, the greatest dollar amount increase in

average institution based grants awards occurred at HMSIs. The greatest increase in terms of percentage occurred at HSIs.

Table 20

Institution Types and Collective Mean Institution Grant Aid Received per Student From 1999-2005 (in Dollars)

Institution	1999	2000	2001	2002	2003	2004	2005	Change*	Percent increase**
HSIs	1,344	1,277	1,483	1,581	1,499	1,737	2,143	799	59
HBCUs	2,652	2,648	2,731	2,721	2,721	3,052	3,616	964	36
HMSIs	1,949	2,243	2,324	2,218	2,352	2,776	2,940	991	51
PWIs	1,890	2,024	2,282	2,136	2,120	2,357	2,608	718	38
All institutions	1,975	2,102	2,252	2,197	2,220	2,537	2,858	883	45

*Calculated by subtracting institution based grants in 1999 from institution based grants in 2005.

**Calculated by dividing the change from 1999 to 2005 by institution based grants received in 1999.

In summary, all four groups experienced increases in average amounts of institution-based grant dollars. HBCUs consistently provided their students with more grant dollars than any of the other groups. HBCUs were followed by the HMSIs, then the PWIs with the HSIs providing the lowest levels of institution grant aid per student between 1999 and 2005.

Loans

Increases in the average amount of loans provided at all four types of institutions from the years 1999 through 2005 were found (See Table 21). An examination of the differences in averages for all study group institutions from 1999 to 2005 indicated an

increase of \$787 in loans per student over that time. During the six-year period, students at HBCUs consistently received more loan money than students at the other institutions. In addition, the rise in loan amounts per student over these years was the greatest at the HBCUs. By 2005, the increase in the average amount of loans taken out by HBCU students was almost double that of students at HSIs. The trends are depicted in Figure 13.

Table 21

Institution Types and Collective Mean Loan Amounts Received per Student From 1999-2005 (in Dollars)

Institution	1999	2000	2001	2002	2003	2004	2005	Change*	Percent increase**
HSIs	2,435	2,484	2,387	2,385	2,383	2,496	3,024	589	24
HBCUs	2,895	3,255	3,163	3,098	3,409	3,475	4,041	1147	40
HMSIs	2,836	2,560	2,666	2,687	2,952	3,110	3,533	697	25
PWIs	2,694	2,994	2,918	2,951	2,958	3,128	3,397	702	26
All institutions	2,734	2,828	2,805	2,809	2,962	3,095	3,521	787	29

*Calculated by subtracting loans in 1999 from loans in 2005.

**Calculated by dividing the change from 1999 to 2005 by loans received in 1999.

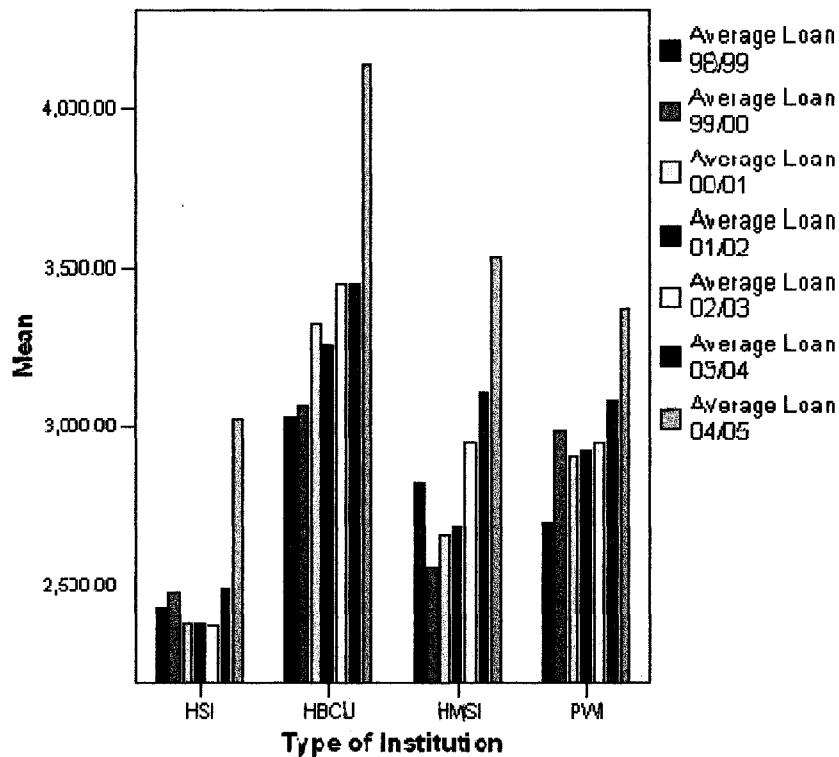


Figure 13. Average amount of loans by institution types from 1999 through 2005.

Data were also analyzed in terms of ranking changes between the institution types. For each aid type, one institution was ranked as the highest and one the lowest in terms of the average amount aid awarded in 1999 and 2005. Then comparisons were made between the rankings. Overall, little change occurred in terms of ranking between 1999 and 2005 (see Tables 22 and 23). In other words, if a group was the lowest in a form of aid in 1999, that group was also the lowest in 2005. The only variation was seen in federal aid. In 1999, HBCUs' students were on average awarded the highest amount of aid. However, in 2005, HSIs' students were given, on average, more dollars than any of the other groups, including HBCUs.

Table 22

Highest and Lowest Averages of Financial Aid in 1999

	Federal grants	State grants	Institution grants	Loans
HSIs			Lowest	Lowest
HBCUs	Highest	Lowest	Highest	Highest
HMSIs		Highest		
PWIs	Lowest			

Table 23

Highest and Lowest Averages of Financial Aid in 2005

	Federal grants	State grants	Institution grants	Loans
HSIs	Highest		Lowest	Lowest
HBCUs		Lowest	Highest	Highest
HMSIs		Highest		
PWIs	Lowest			

Summary of Trends

For the final analysis of this question, the total awarded financial aid averages were derived by adding the average amounts of federal grant aid, state grant aid, institution grant aid, and loan amounts, for the years of 1999 and 2005 (see Table 24). The difference in the averages of all study group institutions from 1999 to 2005 was an increase of \$3,433 or slightly more than 40%. All four study groups experienced increases in all types of aid. The largest, in terms of percent rise, occurred in HMSIs with a 42.42% increase. HSIs followed in terms of percent increase, then PWIs with HBCUs

experiencing the smallest increase in overall calculated financial support. The trend in overall calculated financial aid is depicted in Figure 14.

Table 24

Institution Types and Collective Mean Total Financial Aid Support Received per Students in 1999 and 2005 (in Dollars)

Institution	Total aid in 1999	Total aid in 2005	Change from 1999 to 2005*	Percent increase**
HSIs	7,582	10,708	3,126	41.23%
HBCUs	9,433	12,999	3,566	37.80%
HMSIs	8,531	12,150	3,619	42.42%
PWIs	8,159	11,416	3,257	39.92%
All institutions	8,443	11,876	3,433	40.66%

*Calculated by subtracting total aid in 1999 from total aid in 2005.

**Calculated by dividing the change from 1999 to 2005 by the total aid awarded in 1999.

An examination of the financial aid averages revealed gains in per-student grant and loan amounts at all groups of institutions. For each financial aid type, there were differences in group trends over time. The greatest increase in federal grant aid was found in the HSIs. The HMSIs exhibited the greatest increase in both state and institution aid. HBCUs showed the greatest increase in loan amounts. Given that the HMSIs had the greatest increases in two of the types of financial aid, it was not unexpected that the greatest increase in total financial aid would be demonstrated by HMSIs.

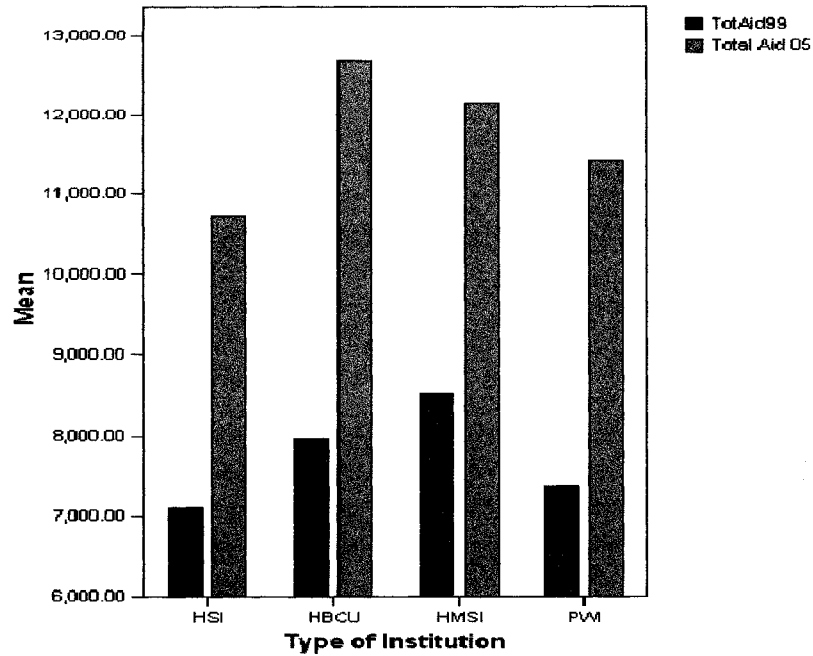


Figure 14. Average total amounts of financial aid by institution types in 1999 and 2005.

Differences in Graduation Rates

Research Question 3. Were there significant differences between the graduation rates of all first-time, full-time students in 2005 at HSIs, HBCUs, HMSIs, and PWIs?

To compare the graduation rates of the four groups, an ANOVA was performed using the 2005 graduation rate as the dependent variable and institution type as the grouping factor (See Table 25). The Bonferroni post hoc analysis was also performed in order to identify paired differences among the four institution groups when indicated.

Results of the ANOVA, $F(3, 166) = 12.05, p < .05$, indicated that there was a significant group effect on graduation rates in 2005 (see Table 25). These figures indicate that there was a significant difference in the 2005 graduation rates among the four groups. A significant ANOVA result provides justification for post hoc analysis which was also performed.

Table 25

Results of ANOVA for 2005 Graduation Rates and Institution Types

Sum of squares	<i>df</i>	<i>F</i>	Sig.
7109.40	3.00	12.05	.00*
32,638.62	166.00		
39,748.02	169.00		

* Significant finding of <.05.

The Bonferroni post hoc analysis was conducted in order to determine if the ANOVA significance could be attributed to a single difference among two groups or multiple group differences. The outcome of the post-hoc analysis revealed significant differences in graduation rates between HSIs and HMSIs, between HSIs and PWIs, between HBCUs and HMSIs, and between HBCUs and PWIs (see Table 26). The post hoc analysis also revealed that HSIs and HBCUs were not significantly different in their graduation rates in 2005. Likewise, the HMSIs and the PWIs were not significantly different in their graduation rates. Thus, the ANOVA significance was determined to be the result of the difference between the HSI's graduation rates and those of the HMSIs and PWIs, and the HBCU's difference in graduation rates with those of the HMSIs and PWIs.

In summary, the ANOVA analysis revealed a significant difference between the 2005 student graduation rates for the four study groups. It was determined that the HIS, HBCU, HMSI, and PWI graduation rates were significantly different overall. However, further analysis indicated no significant differences between the HMSIs and PWIs or between the HSIs and HBCUs. The differences in graduation rates were found to be between the HSIs and both the HMSIs and the PWIs; differences were also found

Table 26

Bonferroni Post Hoc Evaluation of 2005 Graduation Rates Between Institution Types

(I) Type of institution	(J) Type of institution	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval for zero difference	
					Lower bound	Upper bound
HSI	HMSI	-9.56	3.30	.03*	-18.36	-.75
	PWI	-14.15	3.29	.00*	-22.92	-5.37
HBCU	HMSI	-10.95	2.98	.00*	-18.92	-2.99
	PWI	-15.54	2.97	.00*	-23.48	-7.61

* Significant finding of <.05.

between the HBCUs and both the HMSIs and the PWIs. The mean plot in Figure 15 presents a visual representation of these data.

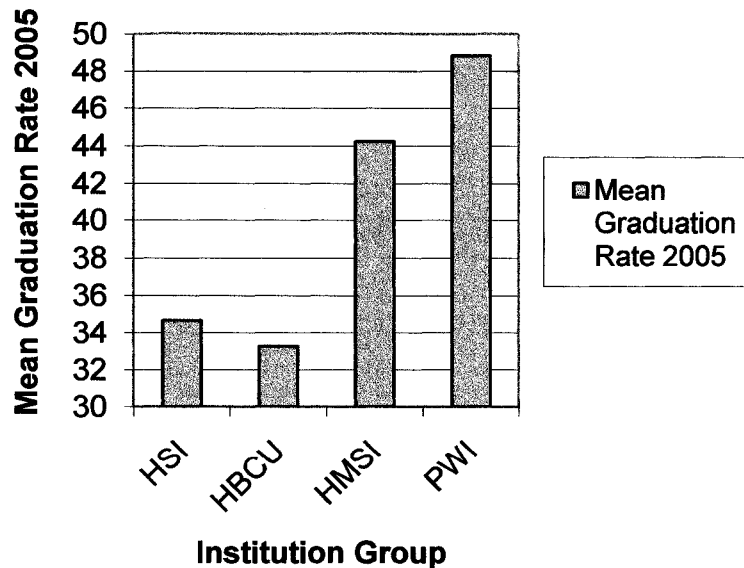


Figure 15. Mean 2005 graduation rates by institution types.

Differences in Financial Aid

Research Question 4: Were there significant differences between the types of financial aid received by students during 2005 at HSIs, HBCUs, HMSIs, and PWIs?

To compare the graduation rates of the four groups, four ANOVAs were performed. The 2005 data regarding the four types of financial aid received was used as the dependent variable and institution types served as the factor grouping (see Table 27). When significant findings ($p < .05$) were identified for the ANOVA, Bonferroni post hoc evaluations were also performed in order to identify paired differences among the four groups.

Table 27

Results of ANOVA for 2005 Financial Aid and Institution Types

Average 2004/2005		<i>df</i>	<i>F value</i>	Sig.
Federal grant aid	Between groups	3.00	3.09	.03*
	Within groups	166.00		
State grant aid	Between groups	3.00	1.57	.20
	Within groups	165.00		
Institution grant aid	Between groups	3.00	7.52	.00*
	Within groups	166.00		
Loan amount	Between groups	3.00	4.85	.00*
	Within groups	166.00		
	Total	169.00		

* Significant finding of $<.05$.

Results of the ANOVAs showed differences in some types of aid. For average federal grant aid, $F(3, 166) = 3.09, p < .05$, indicated that there was a significant group difference in terms of 2005 federal financial aid. For state grant aid, $F(3, 165) = 1.57, p > .05$ suggested that there was not a significant difference among the four groups in the per-student state grant aid in 2005. For institution based grant aid, $F(3, 166) = 7.52, p < .05$ indicated a significant difference among the four groups in the per-student institution grant aid in 2005. For loan amounts, $F(3, 165) = 4.85, p < .05$ revealed a significant difference among the four groups in the per-student loan amounts in 2005 (see Table 27). Thus, the ANOVAs revealed significant differences in three of the four forms of financial aid being considered in the analysis. The significant findings of the ANOVAs for federal grant aid, institution based grant aid, and loan amount results, provided justification for post hoc analysis.

The Bonferroni post hoc analysis was conducted on federal grant aid. Results revealed that only the means of the HSIs and PWIs were significantly different for federal grant aid. All other group comparisons were not significantly different. The post hoc analysis of institution-based grants revealed a significant difference between HBCUs and both the HSIs and PWIs. All other results for group comparisons for institution based grants were not significant.

The post hoc result of the loan amounts were similar to that of institution based grants. Significant differences were found between HBCUs and both the HSIs and PWIs (see Table 28).

Table 28

Bonferroni Post Hoc Evaluation of 2005 Financial Aid and Institution Type

Dependent variable Average 2005	(I) Type of institution	(J) Type of institution	Mean difference (I-J)	Std. error	Sig.
Federal grant	his	PWI	351.03	127.64	.04*
Institution grant	his	HBCU	-1,473.07	329.90	.00*
Institution grant	HBCU	PWI	1,008.42	285.00	.00*
Loan amount	his	HBCU	-1,017.35	276.75	.00*
Loan amount	HBCU	PWI	644.97	239.08	.05*

* Significant finding of $<.05$.

In summary, the ANOVA analyses revealed significant differences in financial aid for three of the four forms under consideration. The HSI, HBCU, HMSI, and PWI financial aid levels were significantly different overall for federal grant aid, institution grant aid, and loan amounts. The post hoc analysis of federal grant aid revealed no significant differences between HMSIs, PWIs, and HBCUs. The only pair to show a significant difference in federal grant aid levels was the HSIs and PWIs.

The post hoc analysis of institution-based grant aid revealed that there were no significant differences between HMSIs and PWIs. The pair-wise comparisons revealed significant differences between the HBCU and both the HSI and PWI. The final post hoc pair wise comparison for differences in loan amounts revealed variations similar to the institution grant aid analysis with significance found between the HBCUs and both the HSIs and PWIs loan amount levels. The mean plot below allows for a visual representation of the results (see Figure 16).

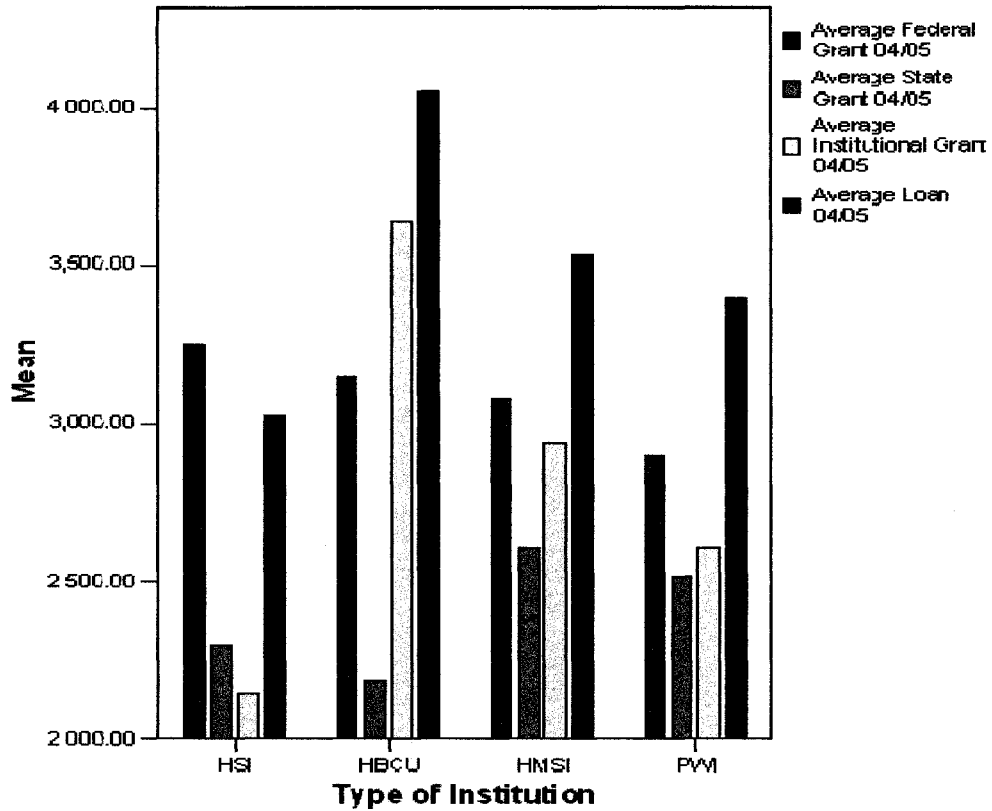


Figure 16. Mean 2005 financial aid by the institution types.

Graduation Rate and Financial Aid

Research Question 5: Were specific combinations of financial aid (average federal grant aid, average amount of state/local grants, average amount of institution grants, and average amount of loans) received by students in 1999 significantly associated with 2005 graduation rates at HSIs, HBCUs, HMSIs, and PWIs?

To determine the presence of significant relationships, regression analyses were run between combinations of financial aid in 1999 and 2005 graduation rates for the four study groups. The dependent variable used in the analysis was average 2005 graduation rates. Six independent variables were included in the regression. The independent

variables were two dummy variables that were coded for geographic region with three geographic regions identified as Southern, Western, and Eastern. The remaining four independent variables were related to 1999 student financial aid. These included federal grants, state grants, institution based grants, and loan amounts.

Using the dummy variables and the 1999 financial aid variables as the independent variables and 2005 graduation rates as the dependent variable, a regression analysis was performed for each study group. An additional regression analysis was completed using combined data from all study institutions. The analysis using all group data was performed to allow for comparison of the individual groups with all groups. A summary of the results of the regression analyses are displayed in Table 29. More detailed statistical results for each regression are provided later in this chapter.

The results of the regression analyses indicated that the overall model was predictive of graduation rates for HMSIs and PWIs but not for HSIs or HBCUs. The regression analyses results also indicated that the full model was significantly predictive of 2005 graduation rates for all institutions, HMSIs and PWIs, but is not significant for HSIs or HBCUs (see Table 30).

Table 29

*Regression Analyses of Aid, Dummy Variables, and Graduation Rates by Institution**Types*

	All institutions	HSIs	HBCUs	HMSIs	PWIs
Model predictive	Sig.	N/S	N/S	Sig.	Sig.
Average federal grants 1999	N/S	N/S	N/S	N/S	N/S
Average state grants 1999	Sig.	N/S	N/S	Sig.	N/S
Average institution-based grants 1999	Sig.	N/S	N/S	Sig.	Sig.
Average loans 1999	N/S	N/S	N/S	N/S	N/S
Dummy South	N/S	N/S	N/S	N/S	N/S
Dummy West	N/S	N/S	N/S	N/S	N/S

Table 30

*Linear Regression Results of the Independent Variables and 2005 Graduation Rates**for the Collective and the Four Institution Types*

Model	R	R Square	Adjusted R square	Sig.
All institutions	.468	.219	.187	.000*
HSIs	.174	.030	-.276	.996
HBCUs	.377	.143	-.055	.637
HMSIs	.542	.478	.478	.000*
PWIs	.657	.432	.347	.001*

* Significant finding of <.05.

Results indicated that 2005 graduation rates, state grant aid and institution based grant aid were significant predictors of the dependent variable for HMSIs. All other independent variables were not significantly related to 2005 graduation rates (see Table 31).

Table 31
Linear Regression Results of Financial Aid and Dummy Variables With 2005 Graduation Rates for HMSIs

	Standardized coefficients <i>B</i>	<i>t</i>	Sig.
Average federal grants 98/99	-.166	-1.20	.24
Average state grants 98/99	.204	2.42	<.05*
Average institution grants 98/99	.642	5.10	<.05*
Average loans 98/99	-.123	-.86	.39
Dummy South	-.248	-1.55	.13
Dummy West	.093	.58	.57

* Significant finding of <.05.

Institution based grant aid was the sole significant predictor of the dependent variable, PWIs' 2005 graduation rates. All other independent variables were not significantly related to 2005 graduation rates (see Table 32).

Table 32

*Linear Regression Results of Financial Aid and Dummy Variables With 2005 Graduation**Rates for PWIs*

	Standardized coefficients <i>B</i>	<i>t</i>	Sig.
Average federal grants 98/99	.041	.28	.78
Average state grants 98/99	.122	.86	.40
Average institution grants 98/99	.539	3.90	<.05*
Average loans 98/99	.163	1.22	.23
Dummy South	-.049	-.28	.78
Dummy West	.150	.83	.41

* Significant finding of <.05.

An analysis of the independent variables' contributions to predicting all study institutions' 2005 graduation rates revealed state grant aid and institution based grant aid as significant predictors of the dependent variable. All other independent variables were not significantly related to 2005 graduation rates (see Table 33).

Thus, of the six independent variables included in the regression analyses examining the relationship to the 2005 graduation rates, only two were found to be significantly associated with the dependent variable when all institution data were combined. The two significantly related predictors of graduation rates were state grant aid and institution based grant aid. Even so, these two variables were not found to be significant in all of the regression analyses.

Table 33

*Linear Regression Results of Financial Aid and Dummy Variables With 2005 Graduation**Rates for All Institutions*

	Standardized coefficients <i>B</i>	<i>t</i>	Sig.
Average federal grant 1999	-.122	-1.61	.11
Average state grant 1999	.285	3.79	<.05*
Average institution grant 1999	.312	4.03	<.05*
Average loan 1999	.035	.44	.66
Dummy South	-.175	-1.56	.12
Dummy West	-.011	-.10	.92

* Significant finding of <.05.

In summary, it was concluded that only when all institutions' data were combined or when the HMSIs were analyzed separately was the combination of 1999 state and institution-based grant aid obtained significantly related to 2005 graduation rates. For PWIs, 1999 institution based grant aid alone was significantly related to 2005 graduation rates. There was not a statistically significant relationship between the dummy variables representing geographic region, average 1999 financial aid awards, and the 2005 graduation rates for the HSIs and HBCUs.

Summary

In an effort to address the study questions, several different analyses were performed on a variety of data. Results, summarizing the findings for each research question, were

presented in tabular form accompanied by a brief description of the key results.

For Research Questions 1 and 2 regarding trends in graduation rates and financial aid, statistical findings indicated that there was a rise in both graduation rates and financial aid for all institution groups between 1999 and 2005 (see Appendix VI). For Research Questions 3 and 4, significant differences were found between the study groups in terms of financial aid and graduation rates (see Appendix VI). Finally, for Research Question 5 regarding significant relationships between the dependent and independent variables, regression analyses were utilized. Using six independent variables, results indicated that 1999 state and institution based grant aid were significantly related to 2005 graduation rates for some of the study groups (see Appendix VI).

Overall, the results indicated that there was a rise in the average amounts of financial aid obtained by students who attended the study institutions between 1999 and 2005. In addition, these same study groups also had an increase in graduation rates over this same period. However, increases in both were not identical between all institution groups.

Statistical findings also indicated that the 1999 state and institution- based grant aid were positively related to 2005 graduation rates at some institutions. Grant aid did not seem to influence graduation rates at HSIs or HBCUs. Thus, differences in the influence of aid were evident between the study institutions and may reflect the complexity of predicting student graduation rates.

CHAPTER 5

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

This chapter has been organized around the five research questions that guided this study and therefore provide an appropriate lens to interpret the results. The first section contains a description of assumptions used during the data interpretation process. In the next section, summary information is presented related to Research Questions 1 and 3 as they both address graduation rates by institution type. The third section applies a similar structure for the summary information focused on financial aid trends. This is related to Research Questions 2 and 4. The fourth section, addressing Research Question 5, contains a discussion of the relationships between graduation rates and financial aid. The chapter concludes with a discussion of study implications, policy recommendations, and suggestions for future research.

Data Interpretation Assumptions

Because of the student diversity at the four types of institutions, it was problematic to make definitive conclusions regarding specific ethnic/racial groups. To reveal these differences, ethnic/racial percentages were calculated for students attending the study institutions. The percentages were then compared to the national averages. All of these percentages were derived from 2005 IPEDS data (see Table 34).

Table 34

Ethnic/Racial Student Percentages by Institution Types in 2005

	Non- Hispanic Caucasian	African American	Latino/a	Asian	Native American
HSI	35.59	8.38	36.69	6.86	2.14
HBCU	13.26	81.66	1.05	.71	.11
HMSI	54.44	16.60	10.56	9.46	1.28
PWI	78.68	7.84	4.26	2.22	.58
Study Group Average*	49.05	27.35	11.05	4.85	.95
National Average**	65.04	12.43	8.50	4.92	1.58

*Calculated from averaging all data from institutions included in the study.

** Percentages derived from data collected fall 2005 from all four-year, degree granting, public institutions in the United States.

From the data displayed in Table 34, it is clear that HSIs and HMSIs had markedly diverse student bodies. In contrast, the study PWIs were less diverse than HSIs and HMSIs and less diverse than national averages with nearly 80% of the students being non-Hispanic Caucasians. Even though the PWIs had a large majority of students from the same racial group, the most homogeneous student bodies were found at HBCUs with over 80% of the students being African American.

Because of the racial/ethnic diversity of the HSIs and HMSIs, it did not seem reasonable to generalize the findings of these two types of institutions to any particular racial/ethnic group. For example, it would not be consistent to report that increased

graduation rates at HSIs would also indicate that a greater percentage of Latino/a students had completed their degrees. This may be true, yet it may be misleading to report this as a finding, because over half of the students who attended HSIs were not Latino/a.

There was, however, justification for comparison and generalization of findings to other student groups. For example, researchers have found that students attending HSIs tended to have more financial challenges than students attending non-HSIs; thus, it seemed practical for the HSI findings to be compared to research on low-income students (Swail, Cabrera, Lee, & Williams, 2005).

Data from this study support the Swail et al. (2005) findings indicating that HSI students had a greater fiscal burden than did non-HSI students. Federal grant aid has been a strong indicator of financial need and has been used to determine whether institutions have economically disadvantaged students (Horn, 2006). Analysis of the percentage of HSI students receiving federal grant aid in 2005 provided empirical evidence to support a finding signifying that students attending the HSIs were more economically disadvantaged than students that attended PWIs. A similar analysis provided support for an analogous finding for the HBCUs and HMSIs. Figure 17 depicts the percentage of students receiving federal grant aid at the four institution types. These percentages were calculated from the IPEDS data used in this study. The data indicated that students attending HBCUs were more financially needy and, therefore, were predicted to be the most economically disadvantaged.

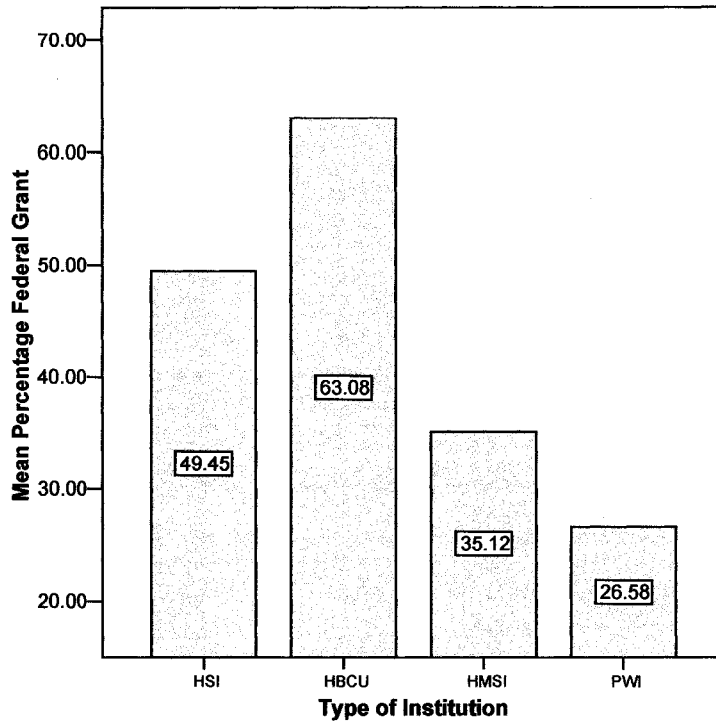


Figure 17. Percentages of students receiving federal grant aid in 2005 by institution types calculated from IPEDs data.

The comparison of the study findings regarding students attending HBCUs, HSIs, and HMSIs, to the results of other investigations that evaluated financial aid and graduation rates of economically disadvantaged students has been justified (Carter, 2006). Conversely, the data from the PWI students should not be compared to data focused on disadvantaged students, because most students attending PWIs did not appear to have as many challenges as students at the other three institutions.

Some racial/ethnic comparisons appeared to be acceptable in the interpretation of the study results. Because of the large percentages of non-Hispanic, Caucasian students attending PWIs, it was reasonable to contrast the PWI results with findings of researchers who examined graduation rates and financial aid trends related to non-Hispanic,

Caucasian students. Similarly, the large number of African American students enrolled in HBCUs provided justification for comparing this study's results from HBCUs to the findings of other researchers who examined African American students (Kim & Conrad, 2006).

Throughout the remaining parts of this chapter, comparisons and generalizations have been made between the findings of this research regarding HBCUs, HSIs, and HMSIs and those of other investigations focused on economically disadvantaged students. The results pertaining to HBCUs have also been compared to research findings that examined African American students. Research findings for PWIs were judged against other investigations that focused on institutions that educated mainly non-Hispanic, Caucasian students.

Graduation Rates by Institution Type

A purpose of this study was to develop a better understanding of student success in terms of program completion. In order to determine this, trends in the average graduation rates of the four types of institutions were evaluated. A second purpose was to determine if there were differences in the 2005 average graduation rates among the four institution types. The statistical evaluation of the data revealed several interesting findings. Following is a summary and discussion of the findings regarding graduation rates and trends for the various institution types.

The two research questions related specifically to graduation rates were:

Research Question 1: What were the trends in graduation rates of students between 1999 and 2005 at Hispanic Serving Institutions (HSIs), Historically Black Colleges and

Universities (HBCUs), neither HSIs nor HBCUs institutions that serve high (25% or higher) populations of minority students (HMSIs), and Predominantly White Institutions (PWIs)?

Research Question 3: Were there significant differences between the graduation rates of all first-time, full-time students in 2005 at HSIs, HBCUs, HMSIs, and PWIs?

Statistical analyses of these data indicated that on average, for all institutions, graduation rates rose nearly four percentage points between 1999 and 2005. Research findings indicate that, nationally, there has been a rise in the percentage of graduation rates (Horn & Berger, 2004; Peter & Horn, 2005). However, differences in increases have been noted between racial/ethnic groups and family income levels (Horn & Berger, 2004). Horn and Berger's findings were consistent with the results of this research project, as it was revealed that HSIs had the greatest percentage increase while HBCUs had the smallest. Since HSIs started with the lowest average graduation rate, the rise over the years pushed their rates over those of HBCUs. Graduation rates of HSIs remained below HMSIs and PWIs, as did the rates of the HBCUs. Thus, HMSIs and PWIs started and finished with higher graduation rates than the HBCU and HSI institutions.

In terms of percentage change, the analysis revealed that all four study groups had increased success as measured by graduation rates. Considerable enhancements were noted for both the HMSI and PWI study groups. The largest increase in graduation rate was found to be 17% at HSIs, while the smallest increase was revealed to be 7% at HBCUs. The relatively low increase in graduation rates for the HBCUs was consistent with other research (Journal of Blacks in Higher Education, 2006/2007).

Researchers have indicated that graduation rates of African American students at non-selective universities, including HBCUs, have not increased at the rate of most other public, four-year institutions (Journal of Blacks in Higher Education, 2006/2007). In fact, at some HBCUs, such as Florida A & M, the graduation rates have declined over the last ten years (Journal of Blacks in Higher Education, 2006/2007; Journal of Blacks in Higher Education, 2005/2006).

The smaller rise in HBCU student success as defined by graduation rates could be related to student bodies that faced greater economic challenges than students attending the other three types of institutions. Lower family incomes are associated with greater financial difficulties and are significantly related to lower graduation rates (Horn & Berger, 2004; Ishatani, 2006).

An article written in the Journal of Blacks in Higher Education (2006, 2007) included an explanation of the lower graduation rates. The authors suggested that the slower rise in HBCU graduation rates may be related to a variety of factors. These include having many students from low-income families, numerous first-generation college students, higher achieving African American students pulled away to flagship universities, and many institutions having lacked large endowment and student scholarship funds (Merisotis, 2005).

Graduation Rate Analyses Summary

This research has been conducted to investigate, to some extent, race/ethnicity and graduation rates. The results revealed the greatest rise in graduation rates occurred at HSIs followed by the PWIs and HMSIs. The smallest increase in graduation rates occurred at the HBCUs. The literature reviewed provided support for these findings

(College Board, 2006b). Overall, graduation rates have been increasing.

Financial Aid Trends

Two purposes of this investigation were to identify trends in financial aid between 1999 and 2005 at the four institution types and to determine if there were differences in the average amounts of financial aid received by students at these institutions in 2005. The summary and discussion of findings for Research Questions 2 and 4 related to financial aid trends follow.

The two research questions related to financial aid were:

Research Question 2: What were trends in financial aid (average federal grant aid, average amount of state/local grants, average amount of institution grants, and average amount of loans) received by students between 1999 and 2005 at HSIs, HBCUs, HMSIs, and PWIs?

Research Question 4: Were there significant differences between the types of financial aid received by students during 2005 at HSIs, HBCUs, HMSIs, and PWIs?

Overall, financial aid received by students at all four types of institutions increased between 1999 and 2005. This upward trend in financial aid was anticipated, since research indicates an overall increase in the dollar amount of aid over the last two decades (College Board, 2006a; Cunningham, 2005; Hearn, 2001).

Even though it was expected that changes in financial aid at the four institution types would be the same, they were not equivalent. For example, the rise in aid at HMSIs was greatest in grant aid, while the largest increase for HBCUs was determined to be loan aid.

In addition, HBCUs experienced the smallest increase in federal and institution-based grant aid.

The findings of this research revealed differences in federal financial aid awards between HSIs and PWIs, with students attending HSIs being awarded, on average, nearly \$400 more than students attending PWIs. As mentioned, federal grant aid has been a strong indicator of financial need (Heller, 2005) and higher award amounts suggested that many students attending HSIs had a higher financial need than did those at PWIs. This finding and the speculation of greater need is consistent with the literature that suggests that students attending HSIs and HBCUs have a greater financial need than students at PWIs (Merisotis & McCarthy, 2005).

With greater need, it could also be speculated that students attending HSIs would take on larger amounts of debt than students at HBCUs or PWIs in order to finance their education. Thus, it was anticipated that the HSI loan amounts would be similar to those at HBCUs, since students attending HBCUs have also tended to be financially disadvantaged (Jackson, 2002; Kim & Conrad, 2006; Merisotis & McCarthy, 2005). However, the results of this research revealed that HSI students took out, on average, approximately \$1,000 less in loan aid during 2005 than did students at HBCUs. No research could be found to explain the significant differences as indicated by the ANOVA test results between average loans at HSIs and HBCUs or that explained why students at HSIs had significantly lower debt than students attending PWIs. However, Hispanic students have been reported to be less likely to take out loans than White or African-American students (Topper, 2007). This may account for some, not all, of this difference since only about one third of the students attending HSIs were Hispanic.

In addition to differences in loan amounts between institution types, institution grant aid varied as well. Institution grant aid *increases* were the smallest for HBCUs, but HBCUs provided significantly larger amounts of institution-based grant aid than did either HSIs or PWIs according to the ANOVA results. Though increases appeared to be smaller, it may be attributed to a relatively high level of support provided by HBCUs over the years and their historically deep commitment to student success and awareness of their students' financial needs (Jackson, 2002; Kim et al, 2006; Merisotis, 2005).

Summary of the Financial Aid Trends

In summary, between 1999 and 2005, there was an upward trend in loans and all types of grant aid awarded at the four institution types. However, the increases in the specific types of financial aid were dissimilar between the four types of institutions. Students attending HSIs had the greatest rise in financial aid with much of that coming from grants. Students attending HBCUs did receive more total aid in 2005 than they did in 1999, but the increase in types of aid was not equivalent. There was a larger increase in loans taken than the other aid types.

There were discernable dissimilarities in the 2005 average financial aid amounts. Federal loans were significantly higher at HSIs than at PWIs. In terms of institution aid, HBCU students were awarded significantly more dollars than HSI or PWI students. This may be due to high need and the long commitment to student success of these institutions. Finally, during 2005, students attending HSIs and PWIs acquired significantly smaller loan amounts than did students enrolled in HBCUs. How these differences in aid influence student success as defined by graduation rates has been discussed in the following section.

Relationship between Graduation Rates and Financial Aid

Researchers have found some relationships between financial aid, access, and graduation rates (Nora, 2003; Perna & Li, 2006; Price, 2005). In this research study, these variables have been studied in the context of HSIs, HBCUs, HMSIs, and PWIs. Research Question 5 which addressed the relationship between various combinations of financial aid and graduation rates was used to guide the research. The summary and discussion of findings related to Research Question 5 which follow are supported by relevant references to the literature and followed by conclusions.

The research question related to financial aid and graduation rates was

Research Question 5: Are specific combinations of financial aid (average federal grant aid, average amount of state/local grants, average amount of institution grants, and average amount of loans) offered students in 1999 significantly associated with 2005 graduation rates at HSIs, HBCUs, HMSIs, and PWIs?

Findings indicated that financial aid had some influence on graduation rates at PWIs and HMSIs. However, this was not true at HSIs and HBCUs. This would indicate, based on these findings, that financial aid offered at HSIs and HBCUs was not predictive of graduation rates. However, other researchers have indicated that there were correlations between aid and graduation rates of mixed ethnic/ethnic groups of students (Heller, 2003; Horn, 2006; Singell & Stater, 2006). Earlier findings indicated that the relationships between access, graduation rates, and financial aid are complex and influenced by a range of variables (Kim, 2004; Johnson, 2006).

In this study, it was expected that all types of grant aid awarded at each type of institution would be predictive of graduation rates. But, this was not the case. The results

indicated that there were relationships between state and institution grant aid when all institution data were used. A significant predictive relationship was found between institution grant aid and graduation rates at HMSIs and PWIs. State aid was predictive of graduation rates at HMSIs. However, these relationships were not found at HSIs and HBCUs, as data indicated that there were no significant relationships between the aid and graduation rates. Thus, it was an unexpected finding that this research study did not reveal a relationship involving these variables at HBCUs or HSIs.

One probable explanation for the differences between groups may be related the amount of aid offered and whether awards were able to meet student needs. Students attending HBCUs and HSIs have tended to be more financially needy and have fewer resources to draw upon to meet expenses of higher education (Merisotis & McCarthy, 2005). Thus, the amount of aid given to these students may not have been enough to make a difference in their levels of success as defined by graduation rates. Offering higher levels of aid to the more needy students may be necessary to improve graduation rates.

Other issues not explored in this study might also help explain why aid did not appear to influence graduation rates at HSIs and HBCUs. It may be true that other individual and institutional factors may be confounding the results. Nevertheless, it is feasible that any type or amount of grant aid may not influence student access, choice, or their graduation rates at HSIs and HBCUs.

Also, loans did not predict student success as defined by graduation rates. Researchers have reported mixed conclusions regarding the influence of loans on graduation rates (Gladieux & Perna, 2005). Some results indicated that loans have had a

detrimental or neutral influence on student persistence (Herzog, 2005; Reynolds & Weagley, 2003). Herzog further reported that, prior to the implementation of a statewide grant program, loans appeared to reduce student persistence. After the statewide program began, it appeared that higher loan amounts did not influence graduation rates. This indicated that the influence of financial aid types on graduation rates may be time sensitive, and there may be an interdependent relationship between the forms of financial aid and their influence on graduation rates. This interdependency was not taken into account in this study.

Reynolds and Weagley (2003) performed a similar investigation examining mainly non-Hispanic, Caucasian students attending a public university. Those researchers found that loans had a negative influence on student persistence. However, Dowd and Coury (2006) studied a similar ethnic/racial mix of students at two- and four-year institutions; and findings indicated that loans did reduce persistence, but did not affect graduation rates. The results also suggested that student income levels may be a factor that mediates the relationship between loans and graduation rates.

Horn (2006) found that other factors, such as race/ethnicity and family income levels, influenced the relationship between aid and graduation rates. Considering this, it would have strengthened this study to control for such variables. However, because of the limited IPEDS data available, the researcher could not control for these variables in this study. As a result, race/ethnicity, income, and other student variables may be exogenous factors that are key to explaining the relationships between loans and graduation rates, but were not addressed in this study.

Another issue that can facilitate the explanation of these findings relates to the possible influence of institutional-level variables. The review of the literature and related research indicated that there were many influential institutional variables. These included selectivity, institution size, and racial mix that influence the relationship between total aid and graduation rates (Fischer, 2007; Horn, 2006). HBCUs and HSIs tended to be less selective than PWIs (Merisotis & McCarthy, 2005). These variables were not taken into account in this study and may have influenced the results of this research project.

There are other possible confounding variables. These variables include the types of aid offered at HBCUs and HSIs. The findings of this project revealed a lack of connection between financial aid and graduation rates within the HBCUs and HSIs included in this study. A possible explanation for this outcome is that specific types and amounts of aid may have varying positive and negative influences on graduation rates depending on types of students. For example, some research indicated that loans were negatively related to graduation rates (Dowd & Court, 2006; Reynolds & Weagley, 2003), but not all researchers suggested a detrimental influence of loans on student graduation (Jones, 2006). Usually, grant aid has been positively correlated with graduation rates (Johnson, 2006; Kerkvliet & Nowell, 2005; Price & Davis, 2006; Singell & Stater, 2006). However, not all studies supported a positive relationship (Metz, 2001). Work completed by Topper (2007) suggested the type and amount of aid provided influenced retention rates of minority students differently than Whites.

In summary, the results of this research further confirmed the complex relationship that exists between financial aid types and graduation rates. The findings and previous research also provided support for the consideration of other factors such as race/ethnicity

and economic status as essential variables influencing the relationship between loans, other types of aid, and graduation rates. How all of these factors ultimately determined student access, choice, and degree completion is still unknown.

Summary

These findings indicated that financial aid did not promote graduation rates in all student groups. Certain types of grant aid were predictive of graduation rates at PWIs and HMSIs. However, student success in terms of graduation rates for students attending HSIIs and HBCUs did not appear to be influenced by amounts of financial aid.

As a result, it was concluded, based on findings that graduation rates and student financial aid are influenced by the type of institution students attend. Additionally, these research findings suggested interdependent relationships between types of aid and student graduation rates at the four institution types included in this study.

Study Implications

The implications of this study reflect a need to further evaluate the financial aid system in public institutions at the institution, state, and national levels for diverse student groups and institution types. The focus of this should be to assist all students, particularly those who are financially challenged, to have access, choice, and opportunities for degree completion.

Based on the findings of this study and in order to provide for access, choice, and completion, it might be desirable to shift from federal grant aid to institution-based aid particularly at PWIs and HMSIs. This may improve graduation rates at these institutions, but this change may also reduce low-income students' access to higher education because

of the merit-based rather than need-based focus of institution aid (Heller, 2003, 2006; Orfield, 2005). Thus, students most likely to be successful without the additional financial aid may receive these awards while limiting funding availability for the need-based students.

This research also brings into question the current federal emphasis on increasing the amount of student loans in order to finance educations. If loans do not improve the access, choice, or graduation rates, they may not provide the best solution in meeting the financial needs of students. Reducing the current emphasis on student loans could positively impact graduation rates.

Policy Recommendations

There are several policy implications of this research project. The results provide evidence indicating different types of aid have varying influences on graduation rates of students attending HSIs, HBCUs, PWIs, and HBCUs. As a result, national and state level policy makers and institutional leaders need to be cognizant that there is a lack of consistency in how students from diverse ethnic/racial backgrounds at the dissimilar institution types respond to the different forms of financial aid. Thus, before decisions are made to modify any type of financial aid offered to students, it would be prudent to gain additional awareness of the impact changes may have on specific groups of students. It should be clear how any alteration would impact access, choice, and graduation rates before adjustments are made.

From a state level perspective, the results of this study suggest that politicians need to develop an evidence-based vision for the future of the financial aid system in their states

(Heller, 2003). The determination as to which students receive state funded financial aid awards, particularly merit-based aid, has not been well directed or coordinated (Archibald, 2002). This lack of consistency may have resulted in some students who were not financially disadvantaged having been awarded thousands of dollars while economically disadvantaged students were not awarded as much assistance as needed to continue their educations (Redd, 2004). In these instances, not only was access denied to economically disadvantaged students, but other goals such as choice and completion were not optimally achieved.

From a federal perspective, the results of this research also suggest that student loans have not been improving student success. A goal of funding student loans has been to improve graduation rates. However, loans have not seemed to be meeting this objective. Thus, it seems prudent for the federal government to consider carefully the impact of spending less on financing student loans.

Regardless of what changes are made at institution, state, or federal levels, a deeper understanding is needed regarding how revisions to the financial aid system are going to impact students. In order to improve student success, the determination of financial aid awards must be research-driven and focused on specific types of students rather than assuming that all students respond to aid in the same manner. This understanding of how different groups of students are influenced by varying types of aid may be enhanced through experimentation with providing dissimilar amounts of aid to targeted student groups and monitoring results.

It is possible that financial aid, regardless of the amount, will not assist some students in successfully completing degrees. Yet, student success may be promoted by effective

financial aid packaging that considers students' individual circumstances. Research can provide the evidence necessary to determine the most effective financial aid packaging to offer to diverse groups of students.

Suggestions for Further Research

These findings have revealed several areas that are in need of additional research. As such, there is an indication that several investigations are required to address the issues of access and graduation rates that were raised by this research.

There is a need to examine the impact of state grant aid on access and the graduation rates at HSIs, PWIs, HBCUs, and PWIs. Investigating how state based aid influences graduation rates at the four institution types may assist in the understanding of the findings and provide direction for policy development and changes in financial aid awards at these institutions.

Another type of financial aid that was not examined in this study due to data unavailability, but that should be investigated in future research, is work-study. Research has indicated that work-study has a positive influence on student retention and graduation rates (Kerkvliet & Nowell, 2005; Pina, 2005; Reynolds & Weagley, 2003). However, there is a gap in the literature relating to the influence of work-study or a combination of work-study and other types of financial aid on graduation rates at the four institution study groups.

Further research is also warranted to specifically evaluate how financial aid influences students at HSIs and HBCUs. There is a need to examine the influence of aid at the individual student level in order to determine if students believe that current levels

of financial support can help them succeed and how different types of aid may or may not influence graduation rates. Such work could expose additional insights into the complex relationships between aid and graduation rates.

Prior to this study, exploration had not been conducted to examine the influence of financial aid on access and graduation rates at these four types of institutions. As a result, this work has contributed to filling a gap in the literature. There is still much that is unknown about this topic indicating a need for additional investigation examining the relationships between complex variables.

Summary

The purposes of this study were to examine the trends in financial aid and graduation rates at four diverse groups of institutions and to identify relationships between aid types and graduation rates at these institutions. The results indicated that there was an upward trend in the relationship between financial aid and graduation rates. In terms of graduation rates, the greatest percentage increase between 1999 and 2005 occurred at HSIs. The lowest percentage increase was at HBCUs. The examination of financial aid indicated that HMSIs had the greatest percentage rise in total financial aid, while HBCUs had the smallest increase between 1999 and 2005 with much of the HBCU growth attributed to a rise in student loans. From the findings, it was apparent that the increases in each variable differed among the four institution types.

Significant relationships were found between the financial aid and graduation rates at PWIs and HMSIs. The results indicated that institution grant aid was the most predictive of graduation rates at these two types of institutions. The findings revealed that no form

of financial aid was predictive of graduation rates at HSIs and HBCUs and suggested that significant confounding variables, which were not studied, existed.

It seems apparent from these findings that the relationships between the types of financial aid and graduation rates are complex. There were several confounding variables not taken into account in this research. This limited the ability to illuminate a clear understanding of the relationships between financial aid and graduation rates.

From the results, it was also evident that specific changes may be warranted in terms of how financial aid is awarded. It is recommended that policy makers become aware that there are inconsistencies in terms of the influence of aid on graduation rates at the different types of institutions. Therefore, changes in how aid is allocated should take into consideration the potential detrimental and positive impacts of modifications on various groups of students.

Prior to policy modifications, additional research is needed to identify other student and institutional variables that influence graduation rates of the four institution types. In addition, research should focus on whether a possible alteration in the manner in which aid is allocated is worth the potential impact that it may have on student success and the ability for certain groups of students to gain access to higher education.

Policy makers also need to be aware that even though graduation rates are indicators of student success, these numbers are just one measure for determining how well higher education is meeting the needs of diverse United States citizens (Bowen et al., 2005). A more complete analysis is required to evaluate the effectiveness of the present financial aid system and the potential impact that making changes to the system will have on student success.

APPENDIX I

SUMMARY OF RESEARCH FINDINGS REGARDING FINANCIAL AID AND STUDENT PERSISTENCE/COMPLETION/GRADUATION RATES

Researcher	Financial issue	Results
Beeson and Wessell (2002)	Work-study with mixed group of students.	Work-study improved retention.
Below (2003)	Grant aid and loans with African American, Hispanic, and White students.	Financial aid did not influence persistence of African American and White students. Hispanic students with high debt had lower persistence.
Dowd and Coury (2006)	Loans with mixed group of students.	Loans had a negative influence on persistence.
Gansemer and Schuh (2006)	Institution grant aid with a mixed group of students.	The influence of institution grants on graduation rates varied depending on selectivity. Students at less selective institutions were benefited by these types of grants. However, this was not true at highly selective institutions.
Gladieux and Perna (2005)	Loans with mixed group of students.	Loans alone were not a negative influence unless students had risk factors. Then, they did.
Herzog (2005)	Unsubsidized loans with mixed group of students.	Unsubsidized loans had reduced program persistence.
Horn and Carroll (2006)	Pell Grants with mixed group of students.	Complex relationships between race/ethnicity, income level, Pell Grant aid, and graduation rates.

Researcher	Financial issue	Results
Johnson (2006)	Grants, loans, and work-study with mixed group of students	Work-study, loans, and grants all increased the likelihood of graduation.
Kerkvliet and Nowell (2005)	Loans and work-study with mixed group of students.	Loans did not influence persistence. Work-study and grants had a positive influence with most students.
Metz (2001)	Pell Grants, loans, and work-study with mixed group of students.	Pell Grant aid not related to completion. Work-study aid was positive related to completion.
Nora, Barlow, and Crisp (2006)	Financial aid with African American, Hispanic, Asian, and non-Hispanic White students.	Higher loan amounts reduced persistence.
Pina (2005)	Grant, loans, and work-study with mainly Latino/a students.	Grant and work-study aid increased persistence more than other types of aid.
Price and Davis (2006)	Merit-based and need-based institution grants with mixed group of students.	Both types of grant aid increased degree completion.
Reynolds and Weagley (2003)	Loans and grants with African American students	Loans had a negative influence. Work-study was a positive factor.
St. John (1999)	Grants, loans, and work-study for African American, Hispanic, American, Asian, and White students.	Influence of aid types changed over time and varied by racial/ethnic group. Overall, all types of aid positively influenced persistence.
Singell and Stater (2006)	Need and merit-based grants.	Increased graduation rates through student selection.
Strauss and Volkwein (2004)	Federal and state grants with mixed group of students.	Both types of grants increased student commitment and indirectly increased persistence.
Wei, Horn, and Carroll (2002)	Pell Grants with mixed group of students.	Pell Grant aid did not influence persistence. May be due to other risk factors.
Williford and Schaller (2005)	Adequacy of financial aid with mixed group of students.	Many students reported that financial aid was a factor in persistence.

APPENDIX II

PUBLIC, DEGREE GRANTING, FOUR YEAR, NOT FOR PROFIT HISTORICALLY BLACK COLLEGES AND UNIVERSITIES IN 1999

1. Alabama A&M University	Alabama
2. Alabama State University	Alabama
3. University of Arkansas at Pine Bluff	Arkansas
4. University of the District of Columbia	District of Columbia
5. Delaware State University	Delaware
6. Florida A&M University	Florida
7. Albany State University	Georgia
8. Fort Valley State University	Georgia
9. Savannah State University	Georgia
10. Kentucky State University	Kentucky
11. Grambling State University	Louisiana
12. Southern University A&M College	Louisiana
13. Southern University at New Orleans	Louisiana
14. Bowie State University	Maryland
15. Coppin State College	Maryland
16. Morgan State University	Maryland
17. University of Maryland Eastern Shore	Maryland
18. Alcorn State University	Mississippi
19. Jackson State University	Mississippi
20. Mississippi Valley State University	Mississippi
21. Harris-Stowe State University	Missouri

22. Lincoln University	Missouri
23. Elizabeth City State University	North Carolina
24. Fayetteville State University	North Carolina
25. North Carolina A&T State University	North Carolina
26. North Carolina Central University	North Carolina
27. Winston-Salem State University	North Carolina
28. Central State University	Ohio
29. Langston University	Oklahoma
30. Cheyney State University	Pennsylvania
31. Lincoln University	Pennsylvania
32. South Carolina State University	South Carolina
33. Tennessee State University	Tennessee
34. Prairie View A&M University	Texas
35. Texas Southern University	Texas
36. Norfolk State University	Virginia
37. Virginia State University	Virginia
38. Bluefield State College	West Virginia
39. West Virginia State University	West Virginia

APPENDIX III

PUBLIC, DEGREE GRANTING, FOUR YEAR, NOT FOR PROFIT HISPANIC SERVING INSTITUTIONS IN 1999

1. California State University –Bakersfield	California
2. California State University –Dominguez Hill	California
3. California State University –Fresno	California
4. California State University –Fullerton	California
5. California State University –Los Angeles	California
6. California State University –Monterey Bay	California
7. California State University –Northridge	California
8. California State University -San Bernardino	California
9. California State University –Stanislaus	California
10. Colorado State University –Pueblo (Formerly Univ. of S. Colorado)	Colorado
11. Florida International University	Florida
12. Northeastern Illinois University	Illinois
13. New Jersey City University	New Jersey
14. Eastern New Mexico University	New Mexico
15. New Mexico Highlands University	New Mexico
16. New Mexico State University	New Mexico
17. University of New Mexico	New Mexico

18. Western New Mexico University	New Mexico
19. CUNY City College	New York
20. CUNY Lehman College	New York
21. Sul Ross State University	Texas
22. Texas A & M University-Corpus Christi	Texas
23. Texas A & M University-Kingsville	Texas
24. The University of Texas at Brownsville	Texas
25. The University of Texas at El Paso	Texas
26. The University of Texas at San Antonio	Texas
27. The University of Texas of The Permian Basin	Texas
28. The University of Texas-Pan American, Edinburg	Texas
29. University of Houston-Downtown	Texas

APPENDIX IV

TABLE OF MATCHED INSTITUTIONS 1999

State & types of institutions within state	HBSUs &/or HSIs	High minority matching institutions (HMSIs)	Low minority matching institutions (PWIs)
Alabama Two HBCUs	AL A & M University AL State Univ.	Auburn Univ. – Montgomery Univ. of West AL	Univ. of Montevallo Univ. of S. AL
Arkansas One HBCU	Univ. of AR Pine Bluff	Univ. of AR at Monticello	AR Tech Univ.
California Nine HSIs	CA State Univ. – Bakersfield CA State Univ. – Dominguez Hills CA State Univ. – Fresno CA State Univ. – Fullerton CA State Univ. – Los Angeles CA State Univ. – Monterey Bay CA State Univ. – Northridge CA State Univ. – San Bernardino CA State Univ. – Stanislaus	CA State Univ. – East Bay CA State Univ. – Sacramento San Diego State Univ. San Francisco State Univ. San Jose State Univ. Univ. of CA - Berkeley Univ. of CA – Davis Univ. of CA – Riverside Univ. of CA - San Diego	CA Polytechnic State Univ. – San Luis Op. CA State Univ. – Chico Humbolt State Univ. Sonoma State Univ.
Colorado One HSI	CO State Univ. – Pueblo	Fort Lewis College	Univ. of CO – CO Springs

State & types of institutions within state	HBSUs &/or HSIs	High minority matching institutions (HMSIs)	Low minority matching institutions (PWIs)
District of Columbia One HBCU	Univ. of District of Columbia		
Delaware One HBCUs	DE State University		Univ. of DE
Florida One HBCU & One HSI	FL A & M University (HBCU) FL International (HSI)	FL Atlantic Univ. Univ. of South FL	FL State Univ. Univ. of North FL
Georgia Three HBCU	Albany State Univ. Fort Valley State Univ. Savannah State Univ.	GA Institute of Technology GA SW State University of W. GA	GA College & State Univ. GA Southern Univ. N. GA College & State Univ.
Illinois One HSI	Northeastern IL Univ.	Chicago State Univ.	Southern IL Univ. - Edwardsville
Kentucky One HBCU	KY State University		Morehead State Univ.
Louisiana All HBCUs	Grambling State Univ. Southern Univ. A & M College Southern University of New Orleans	LA State Univ – Shreveport Univ. of LA – Monroe NW State Univ. of LA	McNeese State Univ. Nicholls State Univ. Southeast LA Univ.
Maryland All HBCUs	Bowie State Univ. Choppin State College Morgan State Univ. Univ. of MD Eastern Shore	Univ. of MD – Univ. College Univ. of MD – Baltimore County Univ. MD – College Park	Frostburg State Univ. Salisbury Univ. St. Mary’s College Towson Univ.

State & types of institutions within state	HBSUs &/or HSIs	High minority matching institutions (HMSIs)	Low minority matching institutions (PWIs)
Mississippi Three HBCUs	Alcorn State Univ. Jackson State Univ. MS Valley State Univ.	Delta State Univ. MS Univ. for Women Univ. of S. MS	Univ. of Mississippi – Main Campus MS State Univ.
Missouri Two HBCUs	Harris-Stowe State Univ. Lincoln Univ.		Missouri Southern State Univ. SE Missouri State Univ.
New Jersey One HSI	NJ City Univ.	Rutgers Univ. – Camden	Rowan Univ.
New Mexico Five HSIs	Eastern NM Univ. NM Highlands Univ. NM State Univ. Univ. of NM Western NM Univ.		NM Institute of Mining
New York Two HSIs	CUNY City College CUNY Lehman College	CUNY Bernard Institute CUNY College of Staten Island	SUNY Empire State SUNY at Buffalo
North Carolina Five HBCUs	Elizabeth City State Univ. Fayetteville State Univ. NC A & T State Univ. NC Central University Winston-Salem State Univ.	Univ. of NC – Pembroke	Appalachian State Univ. Univ. of NC – Asheville Univ. of NC – Charlotte Univ. of NC – Wilmington Western Carolina Univ.
Ohio One HBCU	Central State Univ.		Shawnee State University

State & types of institutions within state	HBSUs &/or HSIs	High minority matching institutions (HMSIs)	Low minority matching institutions (PWIs)
Oklahoma One HBCU	Langston Univ.	Northeastern State Univ.	OK Panhandle State Univ.
Pennsylvania Two HBCU	Cheyney State Univ. Lincoln Univ.	Temple University	Lock Haven University Mansfield University of PN
South Carolina One HBCU	SC State Univ.	Winthrop University	Clemson University
Tennessee One HBCU	TN State Univ.	University of TN – Chat.	Univ. of TN – Martin
Texas Two HBCUs & Nine HSIs	Prairie View A & M Univ. (HBCU) Sul Ross State Univ. TX A & M Univ. – Corpus Christi TX A & M - Kingsville TX Southern Univ. (HBCU) Univ. of TX at Brownsville Univ. of TX at El Paso Univ. of TX at San Antonio Univ. of TX of the Permian Basin Univ. of TX at Pan American Univ. of Houston – Downtown	Angelo State Univ. Univ. of TX- Austin Univ. of North Texas Univ. of Houston – Main TX A & M – International Univ. Lamar Univ. Sam Houston State Univ. Stephen F. Austin State Univ. TX State Univ. – San Marcos Univ. of TX – Dallas TX Women’s College	TX A & M – Commerce Midwestern State Univ. Tarleton State Univ. TX A & M – Galveston TX A & M – Main Univ. of TX – Tyler TX Tech Univ. West TX A & M
Virginia Two HBCUs	Norfolk State Univ. VA State Univ.	Old Dominion Univ. VA Commons Univ.	James Mason Univ. Radford Univ.

State & types of institutions within state	HBSUs &/or HSIs	High minority matching institutions (HMSIs)	Low minority matching institutions (PWIs)
West Virginia Two HBCUs	Bluefield State College WV State Univ.		Fairmont State Univ. Marshall Univ.
Totals	HSIs: 29 HBCUs: 39 Combined: 68	HMSIs: 51	PWIs: 52

APPENDIX V

LIST OF STATES, STATE CODES, REGIONAL
DESIGNATION, AND REGIONAL CODE

State with state code number	Region	"Dummy" coding	Regional code
1. Alabama	South	0, 1	2
2. Arkansas	South	0, 1	2
3. California	West	1, 0	1
4. Colorado	West	1, 0	1
5. Columbia, District of	East	0, 0	3
6. Delaware	East	0, 0	3
7. Florida	South	0, 1	2
8. Georgia	South	0, 1	2
9. Illinois	East	0, 0	3
10. Kentucky	South	0, 1	2
11. Louisiana	South	0, 1	2
12. Maryland	East	0, 0	3
13. Mississippi	South	0, 1	2
14. Missouri	South	0, 1	2
15. New Jersey	East	0, 0	3

State with state code number	Region	“Dummy” coding	Regional code
16. New Mexico	West	1, 0	1
17. New York	East	0, 0	1
18. North Carolina	South	0, 1	2
19. Ohio	East	0, 0	3
20. Oklahoma	West	1, 0	1
21. Pennsylvania	East	0, 0	3
22. South Carolina	South	0, 1	2
23. Tennessee	South	0, 1	2
24. Texas	West	1, 0	1
25. Virginia	South	0, 1	2
26. West Virginia	South	0, 1	2

APPENDIX VI

SUMMARY OF RESEARCH QUESTIONS

Summary of Research Questions 1 and 2

Summary of question	Statistics	Results/Answers
<i>Research Question 1:</i> What were the trends in graduation rates of students between 1999 and 2005 at the four study groups?	Descriptive (Means)	<i>Results:</i> Data indicate an increase in graduation rates of all four institution types over the years.
<i>Research Question 2:</i> What were the trends in financial aid received by students between 1999 and 2005 at the four study groups?	Descriptive (Means)	<i>Results:</i> Data indicate a rise in all types of financial aid for all four groups of institutions over the years.

Summary of Research Questions 3 and 4

Research question	Statistics	Results/Answers
<p><i>Research Question 3:</i> Were there significant differences between the graduation rates of all first-time, full-time students in 2005 at HSIs, HBCUs, HMSIs, and PWIs?</p>	ANOVA	<p><i>Independent:</i> Group designation</p> <p><i>Dependent:</i> Average graduation rates in 2005</p> <p><i>Answer:</i> Yes, significant differences were identified between the study groups.</p>
<p><i>Research Question 4:</i> Were there significant differences between the types of financial aid received by students during 2005 at HSIs, HBCUs, neither HSIs nor HBCUs that serve high populations of minority students, and PWIs?</p>	ANOVA	<p><i>Independent:</i> Group designation</p> <p><i>Dependent:</i> Average amounts of financial aid received in 2005</p> <p><i>Answer:</i> Yes, significant differences were identified between the study groups.</p>

Summary of Research Questions 5

Question	Statistics	Results/Answers
<i>Research Question 5: Were specific combinations of financial aid (average federal grant aid, average amount of state/local grants, average amount of institution grants, and average amount of loans) received by students in 1999 significantly associated with 2005 graduation rates at the four study group institutions?</i>	Regression	<i>Independent:</i> Average amount of federal grant aid, state/local grants, institution grants, loans, and dummy variables for south and west. <i>Answer:</i> Yes and no. Average amounts of state and institution grants were associated with higher graduation rates when all groups' data and Group 3 were used. For PWIs, institution grants were significantly associated with graduation rates. No variables statically related to graduation rates for HSIs and HBCUs.

APPENDIX VII

AVERAGE AMOUNT OF FINANCIAL AID RECEIVED PER STUDENT

IN 2005 BY STATES INCLUDED IN STUDY

State	Federal grants	State grants	Institution	Loan	Total aid average*
Alabama	\$3,027	\$1,380	\$3,395	\$3,983	\$11,784
Arkansas	\$3,108	\$1,667	\$4,084	\$3,919	\$12,779
California	\$3,318	\$2,194	\$3,313	\$2,988	\$11,812
Colorado	\$2,949	\$3,401	\$1,992	\$3,886	\$12,228
Columbia, District of	\$2,861	\$3,777	\$4,969	\$5,792	\$17,397
Delaware	\$3,625	\$0	\$2,746	\$3,625	\$9,996
Florida	\$3,459	\$2,677	\$3,138	\$3,820	\$13,094
Georgia	\$2,966	\$3,646	\$2,625	\$3,183	\$12,420
Illinois	\$3,157	\$2,401	\$3,605	\$3,415	\$12,578
Kentucky	\$2,787	\$1,756	\$3,030	\$2,800	\$10,373
Louisiana	\$2,989	\$2,191	\$2,057	\$3,253	\$10,491
Maryland	\$3,047	\$2,532	\$3,546	\$3,747	\$12,872
Mississippi	\$3,083	\$797	\$3,769	\$3,401	\$11,050
Missouri	\$2,993	\$1,796	\$2,611	\$3,176	\$10,575
New Jersey	\$2,603	\$3,779	\$2,859	\$4,198	\$13,439
New Mexico	\$3,215	\$1,991	\$1,856	\$2,772	\$9,834
New York	\$3,220	\$2,693	\$2,755	\$2,823	\$11,490
North Carolina	\$3,046	\$2,070	\$2,453	\$3,439	\$11,009
Ohio	\$2,552	\$1,006	\$3,652	\$4,511	\$11,720
Oklahoma	\$3,122	\$1,325	\$1,676	\$3,381	\$9,504
Pennsylvania	\$3,058	\$2,755	\$3,806	\$5,708	\$15,327
South Carolina	\$2,802	\$4,406	\$4,591	\$3,990	\$15,790
Tennessee	\$3,198	\$3,438	\$3,949	\$3,810	\$13,662
Texas	\$2,914	\$2,564	\$2,077	\$3,494	\$11,049

State	Federal grants	State grants	Institution	Loan	Total aid average*
Virginia	\$3,288	\$3,257	\$3,060	\$3,268	\$12,872
West Virginia	\$2,932	\$2,997	\$1,823	\$4,207	\$11,959
Average	\$3,068	\$2,429	\$2,858	\$3,521	\$11,805

**Based on the sum of the averages of the four forms of financial aid.*

APPENDIX VIII

SUMMARY OF RESEARCH FINDINGS REGARDING FINANCIAL AID AND STUDENT PERSISTENCE, COMPLETION, AND/OR GRADUATION RATES

Researcher(s)	Results	Findings supported or not by this study
Beeson and Wessell (2002)	Work-study improved retention.	Not studied.
Below (2003)	Financial aid did not influence persistence of African American and White students. Hispanic students with high debt had lower persistence.	Supported findings regarding African Americans. Did not study whether debt related to persistence.
Dowd and Coury (2006)	Loans had a negative influence on persistence, but not on completion.	Not supported.
Gladieux and Perna (2005)	Loans alone are not a negative influence unless students have risk factors. Then, they are.	Not directly studied or supported.
Heller (2003)	Institution need and non-need based grants increased student graduation rates.	Partially supported.
Herzog (2005)	Unsubsidized loans had reduced program persistence.	Not supported.
Horn (2006)	Complex relationships between race/ethnicity, income level, Pell Grant aid, selectivity, and graduation rates.	Partially supported, as many variables seem to influence graduation rates. However, Pell grants were not significant predictor.
Johnson (2006)	Work-study, loans, and grants all increased the likelihood of graduation.	Partially supported. Grants were influential with some groups. Loans were not. Work-study was not included.

Researcher(s)	Results	Findings supported or not by this study
Kerkvliet and Nowell (2005)	Loans did not influence persistence. Work-study and grants had a positive influence with most students.	Partially supported. Loans not influential. Work-study not evaluated. Grants had some influence with some groups.
Metz (2001)	Pell Grant aid not related to completion. Work-study aid was positive related to completion.	Supported work on Pell Grants. Work-study not included.
Nora, Barlow, and Crisp (2006)	Higher loan amounts reduced persistence.	Not supported.
Pina (2005)	Grant and work-study aid increased persistence.	Partially support. Some forms of grant influenced graduation rates. Work-study not studied.
Price and Davis (2006)	Merit and need-based institution grants increased degree completion.	Partially supported. Merit and need-based grants not studied separately. Institution grants did influence graduation rates with some students.
Reynolds and Weagley (2003)	Loans had a negative influence. Merit, need-based aid did not influence persistence. "Other" grants and work-study did have a positive influence. Work-study was a positive factor.	Loan findings not supported. Partial support of grant findings. Work-study not evaluated.
St. John (1999b)	Influence of aid types changed over time and varied by racial/ethnic group. Overall, all types of aid positively influenced persistence.	Partially support. Some influence of state and institution grants for some student groups. Work-study not studied.
Singell and Stater (2006)	Increase in graduation rates through student selection by need and merit based aid process.	Merit and need-based grants not studied separately. But, for many students, institution grants did influence graduation rates.
Strauss and Volkwein (2004)	Federal and state grants increased student commitment and indirectly increased persistence.	Partially supported as state grants being beneficial to some. Little support for federal grants.

Researcher(s)	Results	Findings supported or not by this study
Wei, Horn, and Carroll (2002)	Pell Grant aid did not influence persistence. May be due to other risk factors.	Supported.
Williford and Schaller (2005)	Many students reported that financial aid was a factor in persistence.	Not studied.

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