

Differences in Black Student Enrollment in Texas Doctoral Programs Over Time

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Abstract: *In this study, the numbers and percentages of Black students who were enrolled in doctoral programs in Texas over time were analyzed. Archival data were obtained from the Texas Higher Education Coordinating Board Interactive Accountability system for the 2004-2005, 2009-2010, and 2014-2015 academic years. Inferential statistical procedures revealed that the number of Black students enrolled in doctoral programs in Texas increased by an average of 14 students, or 2% between the 2004-2005 and 2009-2010 academic years. For the 2009-2010 and 2014-2015 academic years, statistically significant differences were not present in the number or in the percentage of Black students enrolled in doctoral programs in Texas. Between the 2004-2005 and 2014-2015 academic years, however, Black student enrollment in Texas doctoral programs increased by an average of 21 students, or 4.27%. Implications of these findings and recommendations for future research are discussed.*

Keywords: Black students; enrollment; doctoral students; doctoral programs; diversity initiatives; education initiatives; Texas Higher Education Coordinating Board; equality & equity; academic

Introduction

Over the past two decades, the demographics have changed considerably in the United States and so have the demographics of student populations in postsecondary institutions (Kater, 2017; Russell, 2012). Colleges and universities in the United States are adapting to the increasing enrollment of first-generation students, students who are economically disadvantaged, and students of color—all underrepresented students who are often socially marginalized and frequently determined to be particularly at-risk for earning a college degree (Hall and O’Neal, 2016; Hunsaker and Thomas, 2013; Oleson-McBride, Hassemer and Hoepner, 2016). The increasing enrollment of students of color and other underrepresented students in colleges and universities has intensified the necessity to understand and to meet the needs of this student population.

In response to the increased need to identify and meet the needs of students of color and other underrepresented students, research activities on the experiences of these student populations

in higher education have increased. The vast majority of these research studies has been conducted by researchers who have focused on the undergraduate experience of this student population. Few researchers have conducted investigations into the challenges and experiences encountered by students of color and other underrepresented students pursuing a graduate education, in particular a doctoral-level education (Griffin and Muniz, 2011). Moreover, although the percentage of first-generation, low-income, and students of colors who are enrolled in undergraduate programs has increased in postsecondary institutions in the United States, the enrollment of students of color and other underrepresented students in graduate programs has not increased (Griffin and Muniz, 2011). Substantial disparities were present in graduate program enrollment in terms of ethnicity/race alone—76.6% of graduate students were White, whereas only 11.8% were Black/African-American, 10.9% were Hispanic, 0.5% were American Indian/Alaskan Native, and 0.2% were Native Hawaiian/Pacific Islander (Council of Graduate Schools, 2016).

Although some states have implemented diversity initiatives and most postsecondary institutions across the nation have revised their mission statements and strategic plans to include diversity, the enrollment rates of students of color in advanced degree programs continues to be substantially lower than the enrollment rates of their counterparts. The racial/ethnic disparity in graduate program enrollment and the lack of research studies on the pursuit of a graduate education by students of color is problematic for several reasons. First, as a society, the United States has moved far beyond viewing a high school diploma as a means of facilitating upward social mobility and attaining financial security. As the job market becomes increasingly saturated with individuals possessing bachelor's degrees, a reasonable assumption can be made that, in the not so distant future, an undergraduate education might not be sufficient in terms of earning and accumulating social and financial capital as well as in establishing employment stability.

Second, promoting and investing in research and resources designed to promote graduate education and the attainment of advanced degrees by students of color is necessary if state and national initiatives are to come to fruition in terms of promoting a diverse and educated workforce, facilitating and sustaining a healthy economy, and in remaining competitive in the global economy. The average earnings of individuals with master's and/or doctoral degrees are substantially higher than the average earnings of those individuals with only a bachelor's degree (U.S. Census Bureau, 2017a). Simply stated, the more money people make, the more they contribute to economic growth.

Third, educators are faced with an increased demand for racial/ethnic diversity in the professoriate (Holley and Gardner, 2012; Kniffin, 2007; Smith, Turner, Osei-Kofi and Richards, 2016) and for racial/ethnic diversity in the fields of science, technology, engineering, and mathematics (STEM)—professions that most often require a doctoral education. Yet, despite the growing importance of attaining a graduate education and the demand for racial/ethnic diversity in the professoriate and in STEM fields, students of color and other underrepresented students are much less likely than their counterparts to pursue and earn a graduate degree (Franklin and Slate, 2012; Portnoi and Kwong, 2011), and the dearth of research on the reason(s) for this disparity is a cause for concern (Hall and O'Neal, 2016;

Olson-McBride et al., 2016). To meet the demand for racial/ethnic diversity in the professoriate and in STEM fields, a racially/ethnically diverse student population must first earn a doctorate, yet only 14.4% of doctorates are awarded to students of color in the United States (National Science Foundation, National Center for Science and Engineering Statistics, 2016). Indeed, Holley and Gardner (2012) noted both the lack and importance of diversity in doctoral programs:

Over the past 20 years, increased attention has been directed toward doctoral degree attainment. This attention is in part attributable to the central role that the degree plays in the higher education system. Doctoral programs train future scholars, who in turn construct a variety of academic, research, and other professional careers. Given the importance of the degree to the country's scientific ambitions and economic security, concern has been expressed over the lack of student diversity in doctoral programs. (p. 112)

A specific student population that has received very little attention in terms of scholarly research is the enrollment of Black students in doctoral degree programs (Howard, 2017). Indeed, Black students are underrepresented in academia as a whole and are particularly underrepresented in doctoral programs (Howard, 2017). As previously noted, Black students constitute only 11.8% of the graduate student population in the United States and comprise only 6% of the graduate student population in the arts and humanities, in biological and agricultural sciences, and in engineering and physical sciences (Council of Graduate Schools, 2016). Moreover, the U.S. Census Bureau (2017) educational attainment data revealed that 3,109 doctoral degrees were awarded to White students and 2,915 degrees were awarded to Hispanic students, whereas only 297 doctoral degrees were awarded to Black students in the United States.

As noted by Peteet and Lige (2016), Black students encounter unique challenges in their pursuit of an advanced degree, and because Black students are underrepresented in graduate programs, research on advancing the education of Black students is “of paramount importance” (p. 97). Yet, a search of electronic databases and a review of the literature in peer-reviewed academic journals for research articles published in the last 18 years yielded a very limited number of published research articles on the effectiveness of diversity and education initiatives in increasing the enrollment rates of Black and other students of color in doctoral programs. Of these studies, only one researcher (Franklin, 2013) focused on a diversity and education initiative and the enrollment of students of color in master's and doctoral programs.

Noting the lack of research on students of color at the graduate level, Franklin (2013) assessed the degree to which differences were present by ethnic/racial membership in graduate degrees awarded by public, 4-year postsecondary institutions in the state of Texas. Franklin (2013) established that from 2000 through the 2011 academic years, White students earned the highest number and percentage of master's degrees and doctoral degrees, followed by Hispanic and Black students, respectively. In addition, White students were awarded the highest number and percentage of professional degrees; however, the number and percentage

of professional degrees awarded to Hispanic and Black students varied (Franklin, 2013). Franklin (2013) further determined that the number of master's degrees and doctoral degrees received by White, Hispanic, and Black students increased for each group from the 2000 academic year through the 2011 academic year, whereas statistically significant differences were not present in the number of professional degrees earned between each of the three groups of students.

Regarding the average percentage of master's degrees awarded in the 2000 academic year and the 2011 academic year, fewer master's degrees were earned by White students in the 2011 academic year than in the 2000 academic year, whereas more master's degrees were earned by Hispanic students and Black students, respectively, in the 2011 academic year than in the 2000 academic year (Franklin, 2013). Results for the average percentage of doctoral degrees awarded in the 2000 academic year and the 2011 academic year were similar for White students. However, more doctoral degrees were awarded to Black students and to Hispanic students, respectively, in the 2011 academic year than in the 2000 academic year (Franklin, 2013). In terms of the average percentage of professional degrees awarded, Franklin (2013) documented that more professional degrees were awarded to White students in the 2011 academic year than in the 2000 academic year. However, for Hispanic students and Black students, statistically significant differences were not present in the average percentage of professional degrees awarded in the 2011 and 2000 academic years.

For the purposes of this study, the term doctoral program refers to an academic degree plan comprised of doctoral level courses that, upon successful completion, results in a doctorate degree, which is the highest level of academic degrees.

Statement of the Problem

Researchers have focused primarily on the undergraduate experience of students of color and other underrepresented students—students who are often times determined to be particularly at risk for successfully completing a postsecondary education, whereas very few researchers have concentrated on the difficulties and challenges encountered by students of color who endeavor to pursue a graduate education. Although the enrollment of students of color in undergraduate programs has rapidly increased, the enrollment of this student population in master's and/or doctoral programs has not increased. The racial/ethnic disparity in graduate program enrollment and the lack of research on the pursuit of a graduate education by students of color is problematic for three primary reasons. First, the necessity of pursuing a graduate education and earning an advanced degree is becoming increasingly necessary for employment and financial stability at the individual level. Second, on both the state and national levels, a graduate education is becoming increasingly important for promoting and sustaining an ethnically and racially diverse, educated workforce and for stimulating and sustaining economic growth. Third, although some states and postsecondary institutions have implemented diversity and education-related initiatives, little research has been conducted to determine the effectiveness of these initiatives, especially in terms of enrollment and completion rates for students of color in master's and/or doctoral degree programs.

Significance of the Study

Because little research has been conducted on Black and other students of color's enrollment in doctoral programs, limited empirical evidence exists regarding the effectiveness of diversity and education initiatives or other interventions designed to increase the enrollment of Black and other students of color in doctoral programs. As previously noted, only one study (Franklin, 2013) was conducted on a state-wide diversity and educational initiative and the enrollment of students of color in doctoral programs. The importance of this research investigation rests primarily in providing an update to Franklin's (2013) findings on a Texas initiative termed *Closing the Gaps by 2015* that was adopted in 2000 by the Texas Higher Education Coordinating Board—a board created by the Texas Legislature in 1965 to oversee all public postsecondary education in the state of Texas. The overall purpose of the Closing the Gaps by 2015 initiative was to prevent the educational decline of Texas citizens and to promote the growth of a healthy state economy. More specifically, the initiative was designed to increase college completion rates for students who represented populations traditionally underrepresented in higher education and to close education and achievement gaps in student participation, student success, excellence, and research. In addition, the significance of this study resides in the contribution it will provide toward addressing the aforementioned problems and the near absence of research and literature on the enrollment of Black students in doctoral programs

Purpose of the Study

The general purpose of this study was to investigate whether a diversity and education initiative within the state of Texas, Closing the Gap by 2015, had influenced the number and percentage of Black students' enrollment in doctoral programs over an 11-year period. Specifically, six purposes were present in this research investigation. The first three purposes of this study were to determine the degree to which differences were present in the number of Black students enrolled in doctoral programs in Texas between the 2004-2005 and 2009-2010 academic years, between the 2009-2010 and 2014-2015 academic years, and between the 2004-2005 and 2014-2015 academic years. The last three purposes of this study were to ascertain the degree to which differences were present in the percentage of Black students enrolled in doctoral programs in Texas between the 2004-2005 and 2009-2010 academic years, between the 2009-2010 and 2014-2015 academic years, and between the 2004-2005 and 2014-2015 academic years. These academic years were selected to reflect the first years in which data were reported by the Texas Higher Education Coordinating Board; the midpoint of all of the years of data that were available; and then the most recent years of data that were available. By selecting these years for statistical analysis, the degree to which trends were present could be addressed.

Research Questions

The following research questions were addressed in this study

- 1). What are the differences of Black student enrollment in Texas doctoral program over time?
- 2). What are the comparison differences of enrollment in academic year from 2004-2015 of Black student in doctoral program?

Research Design

The strategy of inquiry for this research investigation was a non-experimental causal comparative research design. A causal comparative design is typically used when a study involves an examination of “the relationship between one or more categorical independent variables and one or more quantitative dependent variable” (Johnson & Christensen, 2017, p. 43). Because a comparison of groups in terms of the enrollment numbers and percentages of Black students in doctoral programs was conducted over time, a causal comparative approach was the appropriate method of inquiry. Although experimental research designs tend to generate more evidential information, non-experimental quantitative designs are typically used in educational research (Mertler and Vennatta, 2010).

Participants

Because doctoral programs did not remain stable over time among all of the Texas universities, the sample size of doctoral programs varied. Participants were 4-year public universities in the state of Texas that reported doctoral enrollment data that were accessible through the Texas Higher Education Coordinating Board Interactive Accountability system. The Texas Higher Education Coordinating Board Interactive Accountability System is used to determine the effectiveness of postsecondary institutions, evaluate institutional data to improve student and institutional outcomes, and to emphasize the priorities for postsecondary institutions in the state of Texas. The accuracy of data maintained in this accountability system is verified through consistent audits conducted by the Texas Higher Education Coordinating Board. Excluded from this study were private colleges and universities, community colleges, technical institutions, and health-related institutions. Although doctoral enrollment data for White and Hispanic students were available, only the enrollment data for Black students in doctoral programs were examined.

Procedures

The data for this research investigation were downloaded from the Texas Higher Education Coordinating Board Interactive Accountability system and saved as an Excel file. The Excel file variables were then recoded so that they could be converted into a SPSS data file. The data included the number of Black students enrolled in doctoral degree programs in public, 4-year universities in the state of Texas who reported doctoral enrollment data for the 2004-2005, 2009-2010, and 2014-2015 academic years.

Results

Prior to performing inferential statistics procedures to answer the research questions, the standardized skewness coefficients (i.e., the skewness value divided by the standard error of the skewness) and standardized kurtosis coefficients (i.e., the kurtosis value divided by the standard error of the kurtosis) were calculated to determine if the data were normally distributed. The results of these calculations revealed that 18 of the 24 coefficients, or 75% of the coefficients, were outside the range of normality (i.e., ± 3 , Onwuegbuzie and Daniel, 2002). Because the data were not normally distributed and the dependent variables of enrollment numbers and percentages in doctoral programs were continuous variables and because the independent variables represented two categorically related groups (Slate & Rojas-LeBouef, 2011), a nonparametric, Wilcoxon's dependent samples *t*-test (Huck, 2007) was performed.

To determine if a statistically significant difference was present in the number of Black students who were enrolled in doctoral programs in Texas between the 2004-2005 and the 2009-2010 academic years, a nonparametric, Wilcoxon's dependent samples *t*-test (Huck, 2007) was performed. The results revealed the presence of statistically significant difference in the average number of Black students who were enrolled in Texas doctoral programs between these two academic years, $z = 4.19$, $p < .001$. This difference represented a small effect size (Cohen's *d*) of 0.26 (Cohen, 1988). The average number of Black students who were enrolled in Texas doctoral programs increased by about 14 students from the 2004-2005 academic year and the 2009-2010 academic year. Descriptive statistics for this analysis are presented in Table 1.

Table 1: Descriptive Statistics for Black Student Enrollment Numbers in Doctoral Programs in the 2004-2005 and 2009-2010 Academic Years in Texas

Academic Year	<i>n</i> of universities	<i>M</i>	<i>SD</i>
2004-2005	35	27.97	43.16
2009-2010	35	42.03	62.00

To ascertain if a statistically significant difference was present in the number of Black students who were enrolled in doctoral programs in Texas between the 2009-2010 and the 2014-2015 academic years, a nonparametric, Wilcoxon's dependent samples *t*-test (Huck, 2007) was performed. A statistically significant difference was not revealed in the average number of Black students who were enrolled in Texas doctoral programs between these two academic years, $z = 1.84$, $p = .065$. The average number of Black students who were enrolled in Texas doctoral programs in the 2009-2010 and the 2014-2015 academic years was similar. Table 2 contains the descriptive statistics for this analysis.

Table 2: Descriptive Statistics for Black Student Enrollment Numbers in Doctoral Programs in the 2009-2010 and 2014-2015 Academic Years in Texas

Academic Year	<i>n</i> of universities	<i>M</i>	<i>SD</i>
2009-2010	36	40.83	61.53
2014-2015	36	46.22	60.31

To determine if a statistically significant difference was present in the number of Black students' who were enrolled in doctoral programs in Texas between the 2004-2005 and the 2014-2015 academic years, a nonparametric, Wilcoxon's dependent samples *t*-test (Huck, 2007) was performed. A statistically significant difference was yielded in the average number of Black students who were enrolled in Texas doctoral programs between these two academic years, $z = 4.12$, $p < .001$. This difference represented a small effect size (Cohen's *d*) of 0.30 (Cohen, 1988). The average number of Black students who were enrolled in Texas doctoral programs increased by about 21 students from the 2004-2005 academic year and the 2014-2015 academic year. Descriptive statistics for this analysis are presented in Table 3.

Table 3: Descriptive Statistics for Black Student Enrollment Numbers in Doctoral Programs in the 2004-2005 and 2014-2015 Academic Years in Texas

Academic Year	<i>n</i> of universities	<i>M</i>	<i>SD</i>
2004-2005	33	29.61	43.94
2014-2015	33	50.42	61.30

To ascertain if a statistically significant difference was present in the average percentage of Black students' who were enrolled in doctoral programs in Texas between the 2004-2005 and the 2009-2010 academic years, a nonparametric, Wilcoxon's dependent samples *t*-test (Huck, 2007) was performed. A statistically significant difference was yielded in the average percentage of Black students who were enrolled in Texas doctoral programs between these two academic years, $z = 3.20$, $p = .001$. This difference represented a small effect size (Cohen's *d*) of 0.11 (Cohen, 1988). The average percentage of Black students who were enrolled in Texas doctoral programs increased by about 2% from the 2004-2005 academic year and the 2009-2010 academic year. Table 4 contains the descriptive statistics for this analysis.

Table 4: Descriptive Statistics for Black Student Enrollment Percentages in Doctoral Programs in the 2004-2005 and 2009-2010 Academic Years in Texas

Academic Year	<i>n</i> of universities	<i>M</i> %	<i>SD</i> %
2004-2005	23	10.90	20.00
2009-2010	23	13.10	21.00

To determine if a statistically significant difference was present in the average percentage of Black students' who were enrolled in doctoral programs in Texas between the 2009-2010 and the 2014-2015 academic years, a nonparametric, Wilcoxon's dependent samples *t*-test (Huck, 2007) was performed. A statistically significant difference was not revealed in the average percentage of Black students who were enrolled in Texas doctoral programs between these two academic years, $z = 1.66$, $p = .10$. Descriptive statistics for this analysis are presented in Table 5.

Table 5: Descriptive Statistics for Black Student Enrollment Percentages in Doctoral Programs in the 2009-2010 and 2014-2015 Academic Years in Texas

Academic Year	<i>n</i> of universities	<i>M</i> %	<i>SD</i> %
2009-2010	25	12.77	20.00
2014-2015	25	15.36	21.00

To ascertain if a statistically significant difference was present in the average percentage of Black students who were enrolled in doctoral programs in Texas between the 2004-2005 and the 2014-2015 academic years, a nonparametric, Wilcoxon's dependent samples *t*-test (Huck, 2007) was performed. A statistically significant difference was yielded in the average percentage of Black students who were enrolled in Texas doctoral programs between these two academic years, $z = 3.29$, $p = .001$. This difference represented a small effect size (Cohen's *d*) of 0.29 (Cohen, 1988). The average percentage of Black students who were enrolled in Texas doctoral programs increased by about 4.27% from the 2004-2005 academic year and the 2014-2015 academic year. Descriptive statistics for this analysis are presented in Table 6.

Table 6: Descriptive Statistics for Black Student Enrollment Percentages in Doctoral Programs in the 2004-2005 and 2014-2015 Academic Years in Texas

Academic Year	<i>n</i> of universities	<i>M</i> %	<i>SD</i> %
2004-2005	22	11.30	20.00
2014-2015	22	15.57	22.00

Discussion

The overall purpose of this research investigation was to investigate whether a diversity and education initiative within the state of Texas, Closing the Gaps by 2015, had influenced the number and percentage of Black student enrollment in Texas doctoral programs. More specifically, the purpose of this study was to determine the degree to which differences were present in the number and percentage of Black students' enrollment in Texas doctoral programs between the 2004-2005 and the 2009-2010 academic years, the 2009-2010 and the 2014-2015 academic years, and the 2004-2005 and 2014-2015 academic years. Archival data were obtained from the Texas Higher Education Coordinating Board Interactive Accountability system for the number of Black students enrolled in doctoral degree programs at public, 4-year universities in Texas for the 2004-2005, 2009-2010, and 2014-2015 academic years.

An analysis of the data revealed that the number of Black students enrolled in doctoral programs in Texas increased by an average of 14 students, or an average of 2%, in the 2004-2005 and 2009-2010 academic years. For the 2009-2010 and 2014-2015 academic years, statistically significant differences were not present in the number and in the percentage of Black students enrolled in doctoral programs in the state of Texas. Readers should note that the number of Black students enrolled in doctoral program in the 2004-2005 and 2014-2015 academic years, however, increased substantially by an average of 21 students, or an average of 4.27%.

The results of this study on the number and percentage of Black student enrollment in doctoral programs in Texas institutions were in agreement with the results of Franklin (2013) on the number and percentage of doctoral degrees earned by Black students. Overall, the enrollment of Black students in Texas doctoral programs increased between the 2004-2005 and 2009-2010 academic years and the 2004-2005 and 2014-2015 academic years. Accordingly, the number of doctoral degrees awarded to Black students in the state of Texas also increased from the 2000 academic year through the 2011 academic year (Franklin, 2013).

Although an examination of the results of this study and the findings of Franklin's (2013) study revealed an overall increase in the number and percentage of Black students who

enrolled in doctoral programs and who graduated with doctoral degrees, it is difficult to determine the degree to which these increases were attributable to the Closing the Gaps by 2015 initiative. Nevertheless, an assessment of these enrollment rates further enhances analyses of equity in doctoral programs in the state of Texas and serves to augment the literature on the pursuit and attainment of doctoral degrees by students of color.

Conclusion

Because a need exists to have an educated populace for economic and other reasons, secondary and postsecondary institutions across the United States have been charged with closing the education and achievement gaps and increasing degree completion rates. Additionally, colleges and universities across the nation have made a commitment to promote and foster diversity and equity through their initiatives, their mission statements, and their strategic plans. Yet, some of these initiatives, mission statements, and strategic plans include statements in which equality and equity are addressed as if they were one and the same, when in fact they are quite different. Argued here is that *equality* refers to providing the same opportunities for all students, whereas *equity* demands that leaders in higher education actually know, understand, and address the needs of their students. A review of the literature revealed the paucity of research on students of color and graduate education. The lack of research on students of color and their endeavors to pursue a graduate education suggests that educators know and understand very little about a student population that is becoming increasingly diverse and in need of a graduate education to sustain employment and financial stability and to contribute to economic growth. Further research is needed if higher education leaders are to attain and sustain equity by understanding and addressing the needs of students of color at the graduate level, particularly at the doctoral level.

According to the National Center for Education Statistics (2017), between 2015 and 2026, enrollment in graduate degree programs is projected to increase from 2.9 million students to 3.3 million students. Educational leaders in postsecondary settings have a responsibility to invest in research and resources in ways that will facilitate an equitable representation of Black and other students of color in the projected enrollment rates in graduate degree programs. Moreover, higher education leaders have a moral and ethical responsibility to promote, establish, and maintain equity in their campus cultures and to be *intentional* in their actions in terms of developing and implementing initiatives, policies, programs, and services that are equitable and inclusive.

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