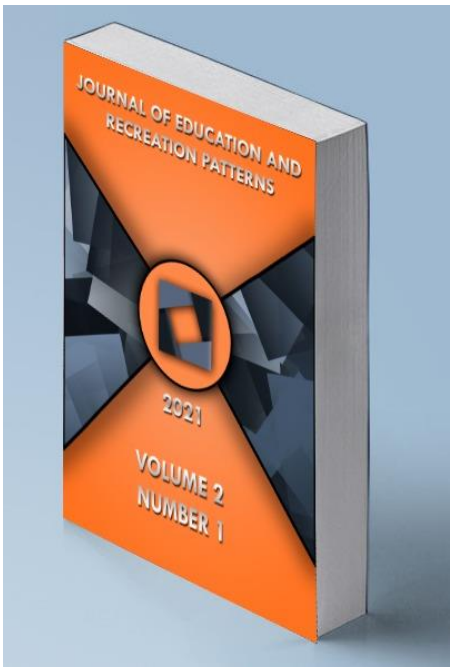

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Ethnic/Racial Differences in Doctoral Degree Attainment in Texas: A Multiyear Analysis

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ABSTRACT

In this multiyear, statewide investigation, the degree to which changes had occurred in the numbers and percentages of doctoral degrees awarded to White, Hispanic, and Black students in Texas public postsecondary institutions from the 1999-2000 academic year through the 2018-2019 academic year was examined. The highest numbers of doctoral degrees were awarded to White students, followed by Hispanic students and Black students, respectively. Statistically significant differences were present for the percentages of doctoral degrees awarded to Hispanic and to Black students between the 1999-2000 academic year and the 2018-2019 academic year. The percentage of doctoral degrees awarded to White students decreased by nearly 21%, whereas the percentage of master's degrees awarded to Hispanic students and to Black students increased by 11.07% and 9.39%, respectively. As such, the ethnic/racial diversity of doctoral degree recipients increased over the academic years of data analyzed herein.

Keywords: Graduate Degree, Advanced Degree, Doctoral Degree, Underrepresented Minorities, Race/Ethnicity

INTRODUCTION

From a historical perspective, a graduate education in the United States has traditionally played a substantial role in producing an educated workforce, promoting successful employment, establishing financial stability, furthering and sustaining a healthy economy, and remaining competitive in the global marketplace (Adhikari, 2017; Altbach, Gumport & Berdahl; Franklin, 2013; Franklin & Slate, 2012; Holley & Gardner, 2012; Koc, 2013; National Science Foundation, 2018; Okahana, Klein, Allum, & Sowell, 2018; Wendler et al., 2010; Wendler et al., 2012). Indeed, "the global competitiveness of the US and capacity for innovation hinges fundamentally on a strong system of graduate education" (Wendler et al., 2010, p. 1). Undeniably, individuals who pursue and obtain a doctoral degree gain knowledge, experience, and skill sets that are critical to the nation's progress in terms of generating new knowledge, discovering new scientific methods, establishing effective leadership, furthering influential research, fostering revolutionary innovations, and solving the complex problems currently facing the nation and the world (Koc 2013; National Science Foundation, 2018; Wendler et al., 2010; Wendler et al., 2012). These individuals work in all areas at the state and national level, including government, technology, science, business, engineering, industry, and academia (Litalien, Guay, & Morin, 2015; National Science Foundation, 2018; Wendler et al., 2010; Wendler et al., 2012). As noted by Wendler et al. (2012), "the link between graduate education and American prosperity has never been stronger than it is today" (p. 1).

From 2010-2020, Wendler et al. (2012) estimated that 2.6 million jobs would require an advanced degree. Specifically predicted was that the number of jobs requiring a doctorate or professional degree would increase by 20% (Wendler et al., 2012). These estimates may be interpreted to mean that an advanced degree is not an option but a requirement for certain occupations—occupations where a graduate education is typically associated with higher salaries (Koc, 2013; Melguizo & Wolniak, 2012; Pedersen, 2015; Wendler et al., 2012; Xu, 2013). Indeed, the expected lifetime earnings for someone with a doctoral degree is $3 million, compared to $2.7 million with a master's degree and $2.3 million with a bachelor's degree (Wendler et al., 2012).

Of particular concern in terms of societal advancement, the economy, and in remaining competitive at both the national and global level is a diverse doctoral-trained workforce, particularly in the fields of science, technology, engineering, and mathematics (STEM) as well as in the professoriate (Dika & D'Amico, 2016; Griffin & Muniz, 2011; Holley & Gardner, 2012; Okahana, et al., 2018; Smith, Turner, Osei-Kofi, & Richards, 2016; Sowell, Allum, & Okahana, 2015). Indeed, Holley and Gardner (2012) made the following observation regarding the importance of doctoral degree attainment as well as the 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 stated national priority in the United States is to promote diversity in doctoral programs in the previously mentioned fields as well as in the overall general workforce (Ebersole, 2010; Griffin & Muniz, 2011; Holley & Gardner, 2012; Okahana & Zhou, 2019; Sowell et al., 2015). Important to note is that the priority of diversity is also present in postsecondary education. The likelihood that contemporary colleges and universities will

become institutions where underrepresented students, particularly racial/ethnic minority students, are engaged at the doctoral level is increased if postsecondary institutions employ a diverse faculty (Millett & Nettles, 2006). However, this requirement presents a conundrum in that for an ethnically/racially diverse faculty to exist, an ethnically/racially diverse student population must first enroll in and complete doctoral programs (Millett & Nettles, 2006). Moreover, "doctoral education is the training ground for the professoriate, and homogeneity in this population calls our ability to meet the needs of our increasingly diverse student body into question" (Griffin & Muniz, 2011).

Although the enrollment of underrepresented students in doctoral programs in STEM and other fields has increased over the past decade, the enrollment of underrepresented students in doctoral programs has been substantially lower than that of their White counterparts (Espinosa, Turk, Taylor, & Chessman, 2019; Griffin & Muniz, 2011; Okahana et al., 2018; Sowell et al., 2015). Despite efforts to diversify the student population in higher education, substantial disparities are present between the enrollment of White students and underrepresented students in STEM and in non-STEM doctoral programs (Holley & Gardner, 2012; Griffin & Muniz, 2011; Okahana et al., 2018; Sowell et al., 2015). Not surprisingly, the low enrollment of underrepresented students in doctoral programs is directly related to low degree completion rates in undergraduate and master's programs.

In the 2016-2017 academic year, 107,445 doctoral degrees were awarded to White students, whereas only 12,493 were awarded to Hispanic students, and 14,027 doctoral degrees were awarded to Black students (National Center of Education Statistics, 2018). These national statistics are reflected in postsecondary institutions in Texas, the state of interest in this study. In Texas, 3,341 doctoral degrees were awarded to White students, whereas only 1,113 doctoral degrees were awarded to Hispanic students and 514 doctoral degrees were awarded to Black students (Texas Higher Education Accountability System, 2018).

Recognizing the near absence of research studies on underrepresented students in advanced degree programs, Franklin (2013) focused on *Closing the Gaps by 2015*, a statewide Texas education and diversity initiative. Franklin (2013) investigated the number and percentage of master's, doctoral, and professional degrees awarded by public 4-year postsecondary institutions in the State of Texas from the 2000 through the 2011 academic years. For purposes of this article, only Franklin's (2013) analysis of the number and percentage of doctoral degrees awarded will be addressed.

Franklin (2013) determined that from the 2000 academic year through the 2011 academic year, a total of 29,335 doctoral degrees were awarded by Texas 4-year postsecondary institutions to White, Hispanic, and Black students. White students obtained the highest number of doctoral degrees throughout the 12-year time period. Specifically, in 2000, 1,193 doctoral degrees were awarded to White students—a number that slightly increased to 1,341 in 2011. The number of doctoral degrees awarded to Hispanic students increased from 121 in 2000 to 243 in 2011. Similarly, the number of doctoral degrees awarded to Black students increased from 84 in 2000 to 192 in 2011.

Although the number of doctoral degrees awarded steadily increased for White, Hispanic, and Black students from 2000 to 2011, the percentage of doctoral degrees conferred fluctuated for all three groups from 2000 to 2011. Specifically, White students earned the highest percentage of doctoral degrees during the 12-year period as well as in each individual year, followed by Hispanic and Black students, respectively. White students were awarded 57.41% of doctoral degrees in 2000—a percentage that climbed to 61.19% in 2001 but then steadily declined to 43.81% in 2011. The percentage of doctoral degrees awarded to Hispanic students increased from 5.82% in 2000 to 7.94% in 2011. Similarly, the percentage of doctoral

degrees awarded to Black students grew from 4.04% in 2000 to 6.27% in 2011. In short, Franklin (2013) concluded that the percentage of doctoral degrees conferred by Texas 4-year public colleges and universities increased for White, Hispanic, and Black students from 2000 to 2011. However, the percentage of doctoral degrees awarded to White students decreased from 2000 to 2011, whereas the percentage of doctoral degrees conferred increased for Hispanic and Black students.

Regarding the percentage change over time for each group, the percentage of doctoral degrees conferred decreased for White students, whereas the percentage of doctoral degrees awarded increased for Hispanic students and for Black students. Specifically, White students were awarded 13.6% fewer doctoral degrees from 2000 to 2011, whereas Hispanic students were awarded 2.12% more doctoral degrees from 2000 to 2011, and Black students were awarded 2.23% more doctoral degrees from 2000-2011.

Several reasons have been given for the disparities in the ethnic/racial composition of students enrolled in doctoral degree programs, one of which is overall acceptance rates into doctoral programs. In 2018, only 23.5% of applicants were accepted into doctoral programs in the United States (Okahana & Zhou, 2019). Another source of disparity in doctoral education is the previously mentioned high rate of attrition—an occurrence that is multidimensional and multifaceted in nature (Gardner, 2009). According to Gittings, Bergman, Shuck, and Rose (2018), approximately 40% to 60% of all doctoral students do not persist to graduation. Moreover, underrepresented racial/ethnic minorities who pursue a doctoral education have higher attrition rates and lower degree-completion rates than their White peers (Sowell et al., 2015). Additional causes of attrition include, imposter syndrome, parental level of education, family obligations, age, lack of interaction with faculty mentors, employment issues, and financial resources (Bergman, Gross, Berry, & Shuck, 2014; Gittings et al., 2018; Litalien et al., 2015; Martinsuo & Turkulainen, 2011; Rockinson-Szapkiw, 2019). Further, the Council of Graduate Schools (n.d.) identified six sources of attrition related to institutional and doctoral program characteristics, including selection, mentoring, financial support, program environment, research mode of the field, and processes and procedures.

Statement of the Problem

Increases in the ethnic/racial diversity of the United States population are reflected in the undergraduate student populations of Texas postsecondary institutions. However, unlike the undergraduate student population, which mirrors more closely the diversity of the nation's population, substantial racial/ethnic disparities exist in the graduate student population, particularly at the doctoral level (Ebersole, 2010; Griffin & Muniz, 2011; Holley & Gardner, 2012; Okahana & Zhou, 2019; Sowell et al., 2015). This state of affairs is problematic when considering the urgency of producing a heterogeneous, doctoral-trained workforce—a workforce comprised of diverse individuals who have the knowledge, critical thinking skills, and problem solving abilities that are needed in the 21st century's knowledge economy (Wendler et al., 2010; Wendler et al, 2012). As noted by Wendler et al. (2010),

> . . . graduate education goes beyond just providing sutdents with advanced knowledge and skills—it also further develops critical thinking skills and produces innovators. It is the application of knowledge and skills in creative and innovative ways that will help ensure our country's future economic prosperity, influence social growth, and mainntain our leadership position in the global economy. (p. 1)

Purpose of the Study

The overall purpose of this study was to determine the degree to which changes had occurred in the numbers of doctoral degrees awarded to White, Hispanic, and Black students in Texas public postsecondary institutions from the 1999-2000 academic year through the 2018-2019 academic year. Also ascertained were the percentages of doctoral degrees awarded to White, Hispanic, and Black students during the same time frame. Specifically, analyses were conducted from the 1999-2000 academic year through the 2018-2019 academic year to determine whether statistically significant changes had occurred in the numbers and percentages of master's degrees awarded to White, Hispanic, and Black students. The final purpose involved ascertaining the extent to which trends were present in both the numbers and percentages of doctoral degrees awarded to White, Hispanic, and Black students in Texas for the 1999-2000 through the 2018-2019 academic years.

Significance of the Study

Procuring a diverse doctoral-trained workforce, particularly in STEM fields and in the professoriate, is of paramount importance to the economic health and standing of the United States in the global community. Toward this end, the Texas Higher Education Coordinating Board implemented two education initiatives in the State of Texas. The first was Closing the Gaps by 2015, which was in operation from 2000 through 2015. The purpose of this initiative was to close the gaps in education in terms of participation, success, excellence, and research (Texas Higher Education Data, 2015). The second initiative was the 60x30TX plan, which was put into practice in the 2015-2016 academic year and which will continue through the 2029-2030 academic year. The overall goal of this plan is to ensure that 60% of students between the ages of 25 to 34 earn a certificate or degree by 2030, graduate with identifiable marketable skills, and obtain employment where student loan debt does not exceed 60% of first-year wages (Texas Higher Education Coordinating Board, 2015).

Given the urgency of promoting and sustaining a diverse and doctoral-educated workforce, the implementation of the aforementioned initiatives is both judicious and relevant. However, simply creating initiatives and implementing them is not sufficient. These initiatives must be examined to ascertain the attained levels of success and equity as they relate to underrepresented students' completion of advanced degree and doctoral degree programs. The results of such an examination would provide essential information to legislators, administrators, graduate program recruiters, and to other educational leaders tasked with making critical decisions with far-reaching implications at all levels of education (Franklin, 2013). Yet, a review of the literature yielded few published research studies where the researchers investigated underrepresented students' attainment of a doctoral degree. Moreover, in the State of Texas, only one study has been conducted (Franklin, 2013) who examined the success of the state's education and diversity initiatives by investigating the attainment of advanced degrees as a function of race/ethnicity.

Because few researchers have explored the effectiveness of education and diversity initiatives both on a national level and on a state level, specifically in Texas, little evidence exists regarding the effectiveness of these initiatives. The significance of this study resides, in part, in a contribution to the limited literature on diversity and equity in graduate education. More specifically, this study will serve as an update to Franklin's (2013) study on Closing the Gaps by 2015. In her study, Franklin. addressed diversity and equity in graduate education from 2000 to 2011. In this article, the data that will be analyzed will include all 15 years of Closing the Gaps by 2015 initiative (1999-2000 through 2014-2015) as well as data for the

60x30TX plan from the 2015-2016 through 2018-2019 academic years. An investigation of the participation of underrepresented students in Texas doctoral programs over the past 19 years will encapsulate more fully any disparities that might be present in terms of a doctoral level education.

Research Questions

The following research questions were addressed in this study: (a) What are the numbers of doctoral degrees awarded to White students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?; (b) What are the numbers of doctoral degrees awarded to Hispanic students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?; (c) What are the numbers of doctoral degrees awarded to Black students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?; (d) What is the difference in the percentage of doctoral degrees awarded to White students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?; (e) What is the difference in the percentage of doctoral degrees awarded to Hispanic students from the 1999-2000 academic year through the 2018-2019 academic year?; (f) What is the difference in the percentage of doctoral degrees awarded to Black students from the 1999-2000 academic year through the 2018-2019 academic year?; and (g) What is the trend in the percentages of doctoral degrees awarded to White, Hispanic, and Black students at public postsecondary institutions in Texas between the 1999-2000 academic year and the 2018-2019 academic year?

METHOD

Research Design

A non-experimental, causal comparative research design was used for this study. This type of design is appropriate when a study involves an examination of "the relationship between one or more categorical independent variables and one or more quantitative dependent variables" (Johnson & Christensen, 2017, p. 43). In this study, the independent variables were academic years and race/ethnicity, and the dependent variables were the numbers and percentages of degrees awarded. The enrollment numbers and percentages of White, Hispanic, and Black students enrolled in doctoral degree programs in the State of Texas were analyzed for the 1999-2000 academic year through the 2018-2019 academic year. An archival dataset was obtained from the Texas Higher Education Coordinating Board's Interactive Accountability website and included only public, 4-year colleges and universities that documented and reported race/ethnicity and doctoral degree information to the Texas Higher Education Coordinating Board.

Participants and Instrumentation

Participants in this study included only public colleges and universities in the State of Texas that reported race/ethnicity data and doctoral degree data to the Texas Higher Education Coordinating Board. This information was retrieved online from the Texas Higher Education Coordinating Board Interactive Accountability system. The purpose of this system is to highlight educational priorities in the State of Texas, to measure the effectiveness of Texas' colleges and universities, and to evaluate data to improve outcomes in the state's postsecondary institutions.

RESULTS

The dependent variables in this study were the number and percentage of doctoral degrees awarded, and the independent variables were race/ethnicity and individual academic years. Because the Texas Higher Education Coordinating Board combines these variables, the appropriate inferential statistical procedures to use were paired samples t-tests. A check of the underlying assumptions of this statistical procedure revealed that the majority of these assumptions were met (Slate & Rojas-LeBouef, 2011). Accordingly, paired sample t-tests were used to answer the inferential research questions presented earlier. The results for each of the seven research questions will be reported separately.

Results for Research Question One

The first research question in this study was "What are the numbers of doctoral degrees awarded to White students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?" To answer this question, descriptive statistics were calculated. As presented in Table 1, the number of doctoral degrees awarded to White students fluctuated throughout the 1999-2000 and 2018-2019 time period. The number of doctoral degrees awarded ranged from a low of 1,034 in the 2003-2004 academic year to a high of 1,532 for the 2014-2015 academic year. The average number of doctoral degrees awarded by Texas universities to White students increased from 1,193 in the 1999-2000 academic year to 1,141 in the 2018-2019 academic year. Overall, an increase of 18.52% was observed in the number of doctoral degrees awarded the White students by Texas universities.

Table 1. Descriptive Statistics for the Number of Doctoral Degrees Awarded to White Students Between the 1999-2000 and 2018-2019 Academic Years.

Academic Year	n of universities	Sum	M	SD
1999-2000	18	1193	66.28	100.57
2000-2001	17	1285	75.59	117.38
2001-2002	19	1120	58.95	91.36
2002-2003	18	1096	60.89	93.44
2003-2004	17	1034	60.82	89.38
2004-2005	20	1070	53.50	89.85
2005-2006	18	1124	62.44	90.80
2006-2007	22	1212	55.09	85.62
2007-2008	22	1246	56.64	91.22
2008-2009	21	1214	57.81	88.90
2009-2010	23	1316	57.22	94.94
2010-2011	23	1341	58.30	90.46
2011-2012	26	1374	52.85	88.90
2012-2013	23	1468	63.83	98.28
2013-2014	24	1503	62.63	97.44
2014-2015	23	1532	66.61	98.73
2015-2016	24	1503	62.63	93.80
2016-2017	23	1450	63.04	87.61
2017-2018	24	1451	63.09	87.64
2018-2019	13	1414	58.92	85.97

Results for Research Question Two

To answer the second research question, "What are the numbers of doctoral degrees awarded to Hispanic students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?"; descriptive statistics were calculated. As delineated in Table 2, the number of doctoral degrees awarded to Hispanic students increased from 121 in the 1999-2000 academic year to 320 in the 2018-2019 academic year. Regarding the years in between 1999-2000 and 2018-2019 the number of doctoral degrees awarded fluctuated from a low of 101 in 2000-2001 to high of 388 in 2016-2017. Similarly, as presented in Table 2, the average number of doctoral degrees awarded by Texas universities to Hispanic students ranged from approximately 7 to 19. Overall, the percentage of doctoral degrees awarded to Hispanic students increased by 164.46% between the 1999-2000 and 2018-2019 academic years.

Table 2. Descriptive Statistics for the Number of Doctoral Degrees Awarded to Hispanic Students Between the 1999-2000 and 2018-2019 Academic Years.

Academic Year	n of universities	Sum	M	SD
1999-2000	15	121	8.07	13.27
2000-2001	14	101	7.21	8.96
2001-2002	16	118	7.38	9.06
2002-2003	14	114	8.14	9.01
2003-2004	15	106	7.07	7.84
2004-2005	16	141	8.81	11.40
2005-2006	16	160	10.00	13.55
2006-2007	17	174	10.24	10.36
2007-2008	15	207	13.80	14.76
2008-2009	15	183	12.20	11.13
2009-2010	19	211	11.11	12.93
2010-2011	21	243	11.57	14.25
2011-2012	21	287	13.67	15.48
2012-2013	22	322	14.64	17.74
2013-2014	20	281	14.05	14.74
2014-2015	22	374	17.00	18.03
2015-2016	19	353	18.58	16.28
2016-2017	21	388	18.48	20.24
2017-2018	20	350	17.50	17.31
2018-2019	22	320	14.55	14.49

Results for Research Question Three

The third research question in this study was, "What are the numbers of doctoral degrees awarded to Black students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?" To answer this question, descriptive statistics were calculated. As revealed in Table 3, the number of doctoral degrees awarded to Black students increased from 84 in the 1999-2000 academic year to 277 in the 2018-2019 academic year. The fewest number of doctoral degrees awarded was 77 in 2003-2004 and the highest was 289 in 2015-2016. Overall, the average number of doctoral degrees awarded by Texas universities to Black students ranged from approximately 6 to 13. Regarding the percentage of degrees awarded, a 229.76% increase was observed from the 1999-2000 academic year to the 2018-2019 academic year.

Table 3. Descriptive Statistics for the Number of Doctoral Degrees Awarded to Black Students Between the 1999-2000 and 2018-2019 Academic Years.

Academic Year	n of universities	Sum	M	SD
1999-2000	11	84	7.64	8.090
2000-2001	10	83	8.30	8.420
2001-2002	13	80	6.15	6.656
2002-2003	12	69	5.75	4.975
2003-2004	14	77	5.50	6.248
2004-2005	14	85	6.07	7.590
2005-2006	15	86	5.73	6.193
2006-2007	16	131	8.19	10.901
2007-2008	18	119	6.61	7.429
2008-2009	17	145	8.53	6.875
2009-2010	17	138	8.12	6.284
2010-2011	21	195	9.29	10.640
2011-2012	22	196	8.91	10.132
2012-2013	21	208	9.90	9.674
2013-2014	22	238	10.82	10.178
2014-2015	20	234	11.70	9.274
2015-2016	22	289	13.14	10.877
2016-2017	22	293	13.32	11.35
2017-2018	23	287	12.48	9.02
2018-2019	23	277	12.04	9.80

Results for Research Question Four

To answer the fourth research question, "What is the difference in the percentage of doctoral degrees awarded to White students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?", a paired samples t-test was calculated. For this research question, a statistically significant difference at the conventional level was not revealed in the percentages of doctoral degrees awarded to White students between the 1999-2000 academic year and the 2018-2019 academic years, $t(16) = -1.89$, $p = .07$. The result approached at .07 but did not reach the conventional level of .05. The percentage of doctoral degrees awarded to White students in the 1999-2000 academic year was 74.75% and decreased to 54.30% in the 2018-2019 academic year. Descriptive statistics for this analysis are presented in Table 4.

Table 4. Descriptive Statistics for the Percentages of Doctoral Degrees Awarded to White, Hispanic, and Black Students Between the 1999-2000 and 2018-2019 Academic Years.

Academic Year	White%	Hispanic%	Black%
1999-2000	74.75	11.95	13.29
2000-2001	88.19	05.94	05.87
2001-2002	77.60	16.25	06.15
2002-2003	80.30	13.38	06.32
2003-2004	77.90	15.15	06.96
2004-2005	83.05	10.25	06.70
2005-2006	76.33	11.35	12.32
2006-2007	76.71	12.28	11.01
2007-2008	66.27	21.92	11.80

2008-2009	75.08	16.43	08.49
2009-2010	74.51	15.65	09.84
2010-2011	71.98	17.34	10.68
2011-2012	66.35	19.89	13.76
2012-2013	65.17	16.55	18.28
2013-2014	68.74	18.73	12.53
2014-2015	67.70	20.38	11.92
2015-2016	61.58	25.20	13.23
2016-2017	58.95	20.34	20.71
2017-2018	57.25	25.96	16.79
2018-2019	54.30	23.02	22.68

Results for Research Question Five

The fifth research question in this study was "What is the difference in the percentage of doctoral degrees awarded to Hispanic students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?" To answer this question, a paired samples t-test was performed. A statistically significant difference was yielded in the percentages of doctoral degrees awarded to Hispanic students between the 1999-2000 academic year and the 2018-2019 academic year, $t(12) = -4.76$, $p < .001$, Cohen's $d = 0.72$. The effect size for this difference was moderate (Cohen, 1988). As presented in Table 4, 11.95% of doctoral degrees were awarded to Hispanic students in the 1999-2000 academic year compared to 23.02% that were awarded in the 2018-2019 academic year. As such, the percentage of doctoral degrees that were awarded to Hispanic students almost doubled in this time period.

Results for Research Question Six

Regarding the sixth research question, "What is the difference in the percentage of doctoral degrees awarded to Black students at public postsecondary institutions in Texas from the 1999-2000 academic year through the 2018-2019 academic year?", a paired samples t-test was calculated. For this research question, a statistically significant difference was yielded in the percentages of doctoral degrees awarded to Black students between the 1999-2000 academic year and the 2018-2019 academic year, $t(10) = -2.64$, $p = .02$, Cohen's $d = 0.97$. The effect size for this difference was large (Cohen, 1988). In the 1999-2000 academic year, 13.29% of doctoral degrees were awarded to Black students. This percentage increased to 22.68% in the 2018-2019 academic year. Accordingly, the percentage of doctoral degrees awarded to Black students more than doubled (i.e., 71%) during this time period. Descriptive statistics for this analysis are presented in Table 4.

Results for Research Question Seven

The seventh research question was "What is the trend in the percentages of doctoral degrees awarded to White, Hispanic, and Black students at public postsecondary institutions in Texas between the 1999-2000 academic year and the 2018-2019 academic year?". As depicted in Figure 1, the percentage of doctoral degrees awarded to White students in the 1999-2000 academic year was 74.75%. This percentage increased to 88.19% in the 2000-2001 academic year and was the highest percentage of doctoral degrees awarded to White students between the 1999-2000 and 2018-2019 academic years. This percentage slightly fluctuated and decreased to 54.30% in the 2018-2019 academic year. Regarding the percentages of doctoral degrees awarded to Hispanic students, 11.95% were awarded in the 1999-2000 academic year.

This percentage increased to 23.02% in the 2018-2019 academic year, representing a total increase of 11.07% between the 199-2000 and 2018-2019 academic years. Similar to the percentage of doctoral degrees awarded to Hispanic students between the 1999-2000 and 2018-2019 academic years, the percentage of doctoral degrees awarded to Black students also increased during the same time period. In the 1999-2000 academic year, 13.29% of doctoral degrees were awarded to Black students. Although this percentage decreased by nearly 7% between the 2000-2001 and 2004-2005 academic years and continued to fluctuate over the remaining years of interest, by the 2018-2019 academic year the percentage of doctoral degrees awarded to Black students had increased to 22.68%. Overall, the percentage of doctoral degrees awarded to White students decreased by 20.45%, whereas the percentage of doctoral degrees awarded to Hispanic students increased by 11.07%, and the percentage of doctoral degrees awarded to Black students increased by 9.39%.

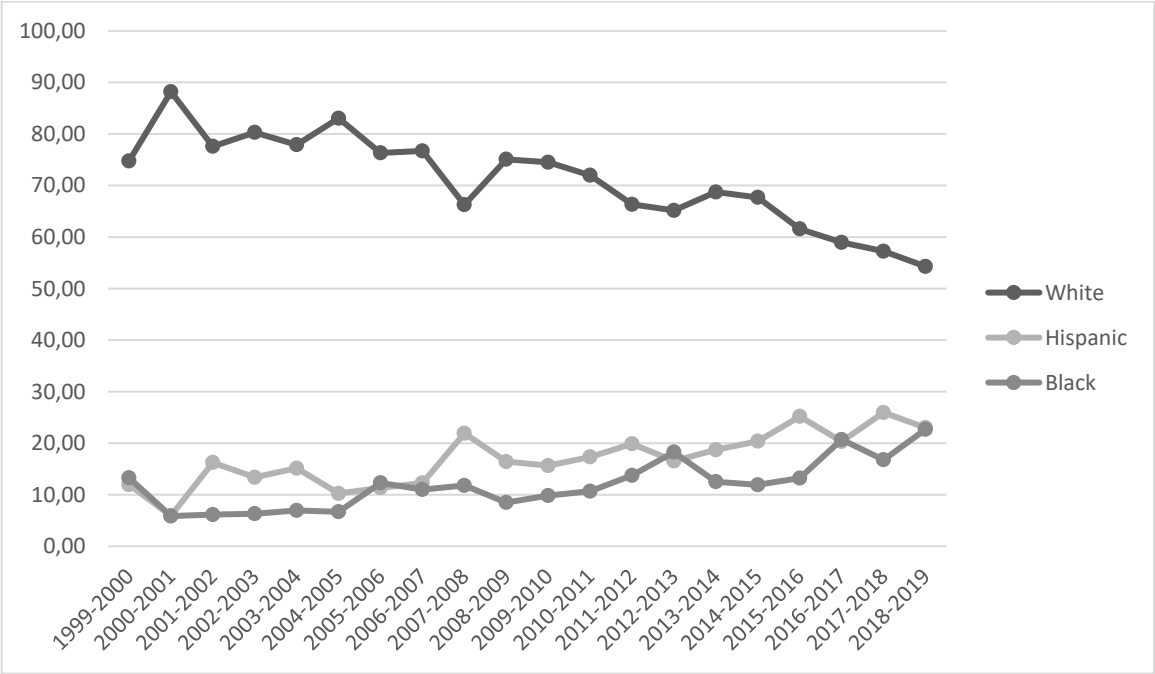

Figure 1. Percentages of doctoral degrees awarded to White, Hispanic, and Black students between the 1999-2000 and 2018-2019 academic years.

DISCUSSION

In this multiyear, statewide investigation, doctoral degree attainment as a function of race/ethnicity in Texas postsecondary institutions was examined within the context of two education and diversity initiatives that were implemented by the Texas Higher Education Coordinating Board—*Closing the Gaps by 2015* and *60x30TX*. During the 20-year period of interest in the current study (i.e., 1999-2000 through 2018-2019), White students were consistently awarded higher numbers of doctoral degrees than were awarded to Hispanic and Black students. Moreover, Hispanic students were consistently awarded higher number of doctoral degrees than were awarded to Black students from the 1999-2000 academic year through the 2018-2019 academic year. All three racial/ethnic groups were awarded higher numbers of doctoral degrees in the 2018-2019 academic year than in the 1999-2000 academic year. The number of doctoral degrees awarded to White students increased by 221, the number of doctoral degrees awarded to Hispanic students increased by 199, and the number of doctoral degrees awarded to Black students increased by 193.

In reference to inferential analyses over time, a statistically significant difference was not revealed in the percentage of doctoral degrees awarded to White students between the 1999-2000 and 2018-2019 academic years. However, statistically significant differences were present in the percentage of doctoral degrees awarded to Hispanic students and to Black students between the 1999-2000 and 2018-2019 academic years. The percentage of doctoral degrees awarded to Hispanic students increased by 11.07%, and the percentage of doctoral degrees awarded to Black students increased by 9.39%. Correspondingly, the percentage of underrepresented students who were awarded doctoral degrees by Texas colleges and universities increased over time.

Connections with Existing Literature

The overall results of the current study were congruent with Franklin's (2013) findings regarding the extent to which advancement had occurred in the number of doctoral degrees awarded to White, Hispanic, and Black students from the 1999-2000 academic year through the 2010-2011 academic year—a time period encompassed by the State of Texas' education initiative, *Closing the Gaps by 2015*. Franklin (2013) documented that the number of doctoral degrees awarded to White students was consistently higher than the number of doctoral degrees awarded to Hispanic students and to Black students between the 1999-2000 and 2010-2011 academic years. Regarding the percentage of change over time for each racial/ethnic group, Franklin (2013) determined that the percentage of doctoral degrees conferred decreased for White students, whereas the percentage of doctoral degrees awarded increased for Hispanic students and for Black students. The results of this study were consistent with the findings of Franklin's (2013) study.

Implications for Policy and Practice

Based upon the findings of this multiyear, statewide investigation, several implications for policy and practice can be made. Because White students have disproportionately been awarded higher numbers and percentages of doctoral degrees than the number and percentages of doctoral degrees awarded to Hispanic and Black students, an urgency exists for policymakers in the State of Texas to scrutinize judicially the effectiveness of the state's past initiative, *Closing the Gaps by 2015*, as well as any progress that might have been made thus far in the state's current initiative, *60x30TX*. When compared to the *Closing the Gaps by 2015* initiative, policymakers involved in the creation of the *60x30TX* plan included more benchmarks regarding the level of degrees earned to include certificates, associate's, master's, doctoral, and professional degrees as well as targets for degrees earned by racial/ethnic groups. Nevertheless, considerable disparities continue to exist at the doctoral degree level. Fortunately, given the broad language of the *60x30TX* initiative, policymakers have a degree of freedom to be inventive in developing and implementing policies designed to increase doctoral degree completion rates for underrepresented racial/ethnic groups. Policymakers are encouraged to assess carefully the degree to which progress has or has not been made toward achieving the targets included in the *60x30TX* plan and to take advantage of the freedom they have to be innovative when creating and implementing policies that include directives specifically aimed at increasing the numbers and percentages of doctoral degrees awarded to underrepresented racial/ethnic students.

Some areas where policymakers might find opportunities to develop policies designed to ensure the success of the *60x30TX* initiative include establishing partnerships between leaders in postsecondary institutions, leaders in the K-12 system, and leaders in the community; assessing funding resources; allocating or reallocating funds; and collaborating with administrators, faculty, and staff in a way that establishes a clear pathway that leads students through a primary education, to a secondary education, to a postsecondary education, and, ultimately to a graduate education. However, simply developing policies is insufficient. Perhaps the greatest challenge will come when attempts are made to implement these policies in a way that is meaningful and that will make a substantial difference in the quality of education that Texans receive. Achieving this objective will demand that policymakers, state agencies, stakeholders, leaders in education, leaders in the community, and practitioners in all education-related areas collaborate with one another. These parties must also commit to developing, implementing, and practicing policies that not only facilitate the provision of a quality education but to ensure the presence of equity in the Texas educational system. It is only with a workforce comprised of diverse individuals who are highly educated that the State of Texas will succeed in sustaining economic health and global competitiveness.

Recommendations for Future Research

Based on the results of this multiyear, statewide investigation, several recommendations for future research can be made regarding the numbers and percentages of doctoral degrees awarded to White, Hispanic, and Black students in the State of Texas. First, the focus of the present study was only on the numbers and percentages of doctoral degrees awarded. Future researchers are encouraged to investigate the numbers and percentages of professional degrees awarded to underrepresented racial/ethnic students to include degrees in medicine, osteopathic medicine, dentistry, veterinary medicine, and pharmaceutical medicine. Second, research on the numbers and percentages of professional degrees awarded to underrepresented racial/ethnic students could be extended by examining the numbers and percentages of professional degrees awarded over time. Third, researchers in the future might consider investigating the numbers and percentages of professional degrees awarded to underrepresented racial/ethnic students in a state other than Texas or to conduct a nationwide study. Fourth, future researchers are encouraged to expand on the current study by including demographic data such as first-generation and socioeconomic status as well as gender.

CONCLUSIONS

The purpose of this study was to ascertain the extent to which changes had occurred in the numbers and percentages of doctoral degrees that were awarded to White, Hispanic, and Black students by Texas postsecondary institutions from the 1999-2000 academic year to the 2018-2019 academic year. Also examined was the degree to which trends were present in the numbers and percentages of doctoral degrees awarded to the aforementioned racial/ethnic groups. Statistical analysis revealed that statistically significant differences were present in the percentages of doctoral degrees awarded to Hispanic students and to Black students from Texas postsecondary institutions between the 1999-2000 academic year and the 2018-2019 academic year. For both Hispanic and Black students, the percentage of doctoral degrees awarded increased from 1999-2000 to 2018-2019. Yet, although it appears that progress has been made during the initial years of the *60x30TX* initiative, considerable disparity remains in the numbers and percentages of doctoral degrees awarded to Hispanic and Black students when compared to their White counterparts. Leaders in higher education must intensify their efforts to further decrease this disparity through policy and practice and through establishing partnerships and

collaborating with individuals in the K-12 system, stakeholders, community leaders, business leaders, and practitioners.

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