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# Differences in Developmental Education Enrollment and Writing Performance at Texas 4-Year Universities: A Multiyear, Statewide Study

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**Abstract:** In this research study, the numbers and percentages of students enrolled in developmental education in writing were determined for the 2002-2003 through the 2009-2010 academic years at Texas 4-year universities. Determined by this analysis was whether the numbers and percentages of students enrolled in developmental education in writing had changed over the 8 years of this study, as well as the degree to which students in developmental education in writing were able to complete a college-level course in writing. Revealed in this multiyear analysis were statistically significant differences in the percentages of students in developmental education in writing between the 2002-2003 and the 2009-2010 academic years. However, the average numbers of students enrolled in developmental education in writing had not changed over this 8 year time period. In the final year of this investigation, almost 40% of students in developmental education in writing did not complete a college-level course in writing. Implications for policymakers and recommendations for future research were provided.

**Keywords:** Developmental Education, Writing, Texas, 4-Year Universities, College-Level Course

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## 1. Introduction

The college degree, once a part of the gold standard for American success, has come under fire in the last decade. [1], *Academically Adrift: Limited Learning on College Campuses*, only minimal learning was occurring in college. [2] presented another example of criticism of higher education with the writing and directing of *Ivory Tower*, a controversial documentary in which the cost of a college degree in relationship to its value was questioned. Even [3], the former United States Secretary of Education, created doubt about a college degree's value with his book, *Is College Worth It?* [3] opposed conventional beliefs about the necessity of college when so many college graduates were unemployed, underemployed, or saddled with staggering debt.

Despite these widely publicized criticisms, ample evidence exists that a college degree remains a valuable asset. [4] reinforced what many Americans already believe: College degree holders earn more money than non-degreed individuals. According to [4], Americans with a bachelor's

degree earn 98% more per hour than those individuals without a 4-year degree, and that percentage has increased steadily each decade since the 1980s. Furthermore, the [5] identified additional support for earning a college degree for Millennials ages 25-32. For those Millennials with a 4-year degree, earnings averaged \$45,500 compared with \$28,000 for those individuals with only a high school diploma. The unemployment rate was only 3.8% for Millennials with a 4-year degree compared with 12.2% for those young people with only a high school diploma. [6] refuted a common concern about a college degree's high cost, which averages \$64,000, and its overall value. A bachelor's degree is "repaid through the increased salary (\$1600 per month, or \$19,200 per year) in less than four years. Not a bad ROI [return on investment], and with a 50% increase in job security to boot" [6, p. 1]. Harsh criticisms about a college degree's value might be prevalent, but its worth for graduates who desire steady employment and higher earnings cannot be denied.

### 1.1. College Readiness in Writing

Although substantial evidence exists to support the importance of earning a college degree, many students do not meet readiness standards that will allow them to experience success in college. In fact, only 19 of every 100 students are ready for college-level course work [7]. According to the [8], 31% of students who took the ACT did not meet any of the college-readiness benchmarks for writing. This percentage is ironic given the fact that average GPAs have increased over the last 20 years as have the number of students enrolled in upper level high school courses [9]. Regardless, college readiness remains a challenge for many students. To address the issue of poor college readiness skills, most states have adopted reforms, including the Common Core Standards, to work toward college readiness for all students and to indicate that a high school diploma actually signals preparedness for college-level courses [10].

According to [11], a series of assessments given to students since 1969 to gauge student educational status and progress, only 24% of high school seniors performed at the proficient level when given a computer-based writing test, indicating these students possessed clear communication skills in writing. Of note only 52% of high school seniors scored at the basic level, a level that indicates only partial mastery of writing skills. Black and Hispanic students scored lower than White and Asian students. Boys scored lower than girls, and students from families without college-educated parents scored lower than students whose parents did have college degrees. As such, [11] provided a revealing empirical analysis of the poor writing skills of high school students, along with identifying the presence of gaps in writing achievement.

Business leaders, too, are noticing lacking writing proficiency among today's workers, many of whom have college degrees. [12] reported that \$3.1 billion is spent by America's businesses to remediate writing among its employees. Employers noted that 26.2% of its college-educated workers had poor writing skills [12]. Marginal writing proficiency seems to extend from the classroom to the work place, creating problems for workers who must produce quality emails, reports, and presentations to succeed.

Several researchers [13, 14, 15] have investigated college readiness specifically as it pertains to writing. [13] investigated multiple reasons behind poor student writing, including grade inflation and reduced standards at the high school level. Although many college students believe their writing is satisfactory, SAT writing scores have shown a downward trend since the 1970s [13]. Furthermore, [14] identified six themes common to both high school and college writing instruction. These themes may inform educators about what students have learned in the past or will learn in the future about writing in hopes of improving college readiness [14]. Interestingly, poor writing skills among incoming college students may be the result of lacking computer literacy in addition to writing struggles. [15] examined struggling writers in relationship to their

challenges with technology and determined that, "The data suggest a cautionary tale in which digital under preparedness poses a hidden threat to students whose degree prospects are already severely reduced by underprepared composition skills" (p. 500).

An additional factor related to technology that may hinder college readiness in writing is the onslaught and popularity of social media. According to the [16], 90% of young adults ages 18-29 use social media. [17] reported that many teachers struggle to assist students about correct writing practices in the face of social media, where abbreviating all words and ideas is favored. Even some younger teachers use shortened forms of written communication, and their standards for writing formality for their students may not be as stringent as that of older teachers [17]. [18] acknowledged that while some educators believe social media expanded writing creativity and opportunities, it also may influence student ability to discern between informal and formal writing, and social media may encourage students to see technology as a toy for entertainment and not a tool for serious writing and research. Therefore, the advantages of technology use for writing may be diminished by social media, which may influence college readiness in writing. As noted, many complex reasons exist for poor writing skills among incoming college students.

### 1.2. Persistence as a Function of Developmental Education

Tinto, a widely recognized scholar and long-time researcher on the subject of college student persistence, advocated the importance of the classroom experience as the primary component to student success. Institutions "must direct their actions to the classroom, especially those in the first year, and construct classrooms whose attributes are such as to enhance the likelihood that students will succeed in the classroom" [19, p. 4]. [19] suggested a combination of high expectations, academic support, frequent feedback, and classroom engagement is crucial to increase student persistence and to improve graduation rates.

Institutions attempt numerous strategies to improve the persistence of students who are most at risk of dropping out of college. According to the [20], dropout rates for low-income and Black and Hispanic students have actually declined since 1990, but these groups of students still have the highest dropout rates when compared with middle and high-income students and White students. [21] identified learning communities as one way to improve student persistence among low-income students. Students in learning communities claimed that attending classes in the same classroom with the same students and the same faculty allowed them to feel comfortable, encouraged, and supported. Persistence among students in learning-community groups was 10% higher at 4-year institutions when compared to students who were not in learning communities [21].

Developmental education is another mechanism used by colleges to provide academic support for students and to improve persistence rates. The goal of developmental

education, oftentimes called remedial education, is to increase college readiness skills so underprepared students can proceed to college-level courses. Regrettably, these courses are not yielding benefits for many students despite the best intentions of educators [22]. [23] revealed that nearly one half of all students who are enrolled in developmental education do not complete the sequence of recommended courses, and many students who do complete the developmental course sequence do not proceed to college-level courses. The lacking effect of developmental education on persistence is troubling.

[24] concluded that developmental education did not positively influence White, Black, and Hispanic student persistence and graduation over a 3-year period. Students who did not enroll in developmental education had higher graduation rates than students who enrolled in developmental education. In most years of the study, White, Black, and Hispanic students who were not required to take developmental education courses had higher persistence rates than those students who were required to take developmental education courses. Equally concerning are the complex challenges associated with developmental education, ranging from discrepancies about the way to define college readiness, unclear and dubious test scores that place students in developmental education, and questions concerning the best way to offer remediation [24]. [23] addressed a common concern about developmental education: It “costs students, the colleges, and the public sector real resources, [C]oncluding that developmental students do as well as similar students who go directly into college courses is not good enough and suggests that remediation wastes money and time” (p. 15).

### 1.3. Statement of the Problem

In *Are They Really Ready to Work?*[25], a study produced by a consortium of human resource professionals that surveyed over 400 employers, workforce readiness was defined as workers who are “equipped with the basic knowledge and applied skills necessary to be competitive in the global economy of the 21st century” (p. 8). Employees’ written communications were a top priority among employers. Unfortunately, 80.9% of high school graduates, 47.3% of 2-year college graduates, and 27.8% of 4-year college graduates were rated as deficient in writing communications per this study and survey.

College students are expected to graduate with at least adequate writing skills, but many students enter college with poor writing skills, and they struggle to overcome those deficiencies during college. Students are enrolled in developmental education courses in college which are designed to remediate and improve basic skills like writing. However, most students are not benefitting from developmental courses [26]. [24] suggested that “support services [need] to be evaluated to determine the extent to which they influence the persistence and graduation rates of students taking developmental education courses” (p. 97). An imperative exists to improve writing skills among college students as a function of developmental writing courses.

### 1.4. Purpose of the Study

The purpose of this research study was to determine the numbers and percentages of students who were enrolled in developmental education in writing at Texas 4-year universities during the 2002-2003 through the 2009-2010 academic years. A second purpose was to ascertain the degree to which the numbers and percentages of students who were enrolled in developmental education in writing changed from the 2002-2003 through the 2009-2010 academic years in Texas 4-year universities. A third purpose was to determine the extent to which student completion of a college-level course in writing changed between the 2003 and the 2010 academic years. The final purpose of this research study was to ascertain the degree to which a trend might be present both in the numbers and percentages of students who were enrolled in developmental education in writing, as well as in student completion of a college-level course in writing, during the 2002-2003 through the 2009-2010 academic years. Given the priorities assigned to retention and 4-year college-degree attainment, an imperative exists to ascertain the relationship between developmental course enrollment in writing and student success.

### 1.5. Significance of the Study

Several researchers [13, 14, 27, 15] have already examined methods to assist unprepared college writers through remediation and developmental education courses in writing in hopes to improve student success in college-level courses. For this study, the phrase, success rates, was used to refer to completion of a college-level course in writing. Few researchers, to date, have focused their efforts on the relationship between developmental courses in writing and the completion of college-level writing courses at Texas 4-year universities over a certain period. Furthermore, an analysis of the relationship between developmental course enrollment in writing and success rates at Texas 4-year universities over time has not occurred to date. By examining the differences in the performance of students who enroll in a developmental writing course and their subsequent completion of a college-level writing course, a trend can be revealed. The findings of this study may assist educators in higher education and in K-12 settings to improve student proficiency in writing. By determining the relationship between developmental course enrollment in writing and success rates, a variety of meaningful interventions could assist students. Students whose writing skills are lacking could then benefit from developmental courses designed to assist struggling writers.

### 1.6. Research Questions

The research questions addressed in this empirical investigation were: (a) What are the numbers of students who were enrolled in developmental education in writing at Texas 4-year universities for the 2002-2003 through the 2009-2010 academic years?; (b) What are the percentages of students who were enrolled in developmental education in writing at Texas 4-year universities for the 2002-2003 through the

2009-2010 academic years?; (c) What is the difference in the average number of students who were enrolled in developmental education writing at Texas 4-year universities between the 2002-2003 and 2009-2010 academic years?; (d) What is the difference in the average percent of students who were enrolled in developmental education writing at Texas 4-year universities between the 2002-2003 and 2009-2010 academic years?; (e) What are the percentages of students who were enrolled in developmental education in writing and who completed a college-level course in writing in the 2002-2003 through the 2009-2010 academic years?; (f) What is the difference in the percentage of students who were enrolled in developmental education writing at Texas 4-year universities and who completed a college-level course in writing between the 2002-2003 and 2009-2010 academic years?; (g) What trend is present, if any, in the numbers of students who were enrolled in developmental education in writing at Texas 4-year universities from the 2002-2003 through the 2009-2010 academic years?; (h) What trend is present, if any, in the percentages of students who were enrolled in developmental education in writing at Texas 4-year universities from the 2002-2003 through the 2009-2010 academic years?; and (i) What trend is present, if any, in the percentages of students who were enrolled in developmental education in writing and who completed a college-level course in writing at Texas 4-year universities from the 2002-2003 through the 2009-2010 academic years?

## 2. Method

### 2.1. Research Design

For this study, a longitudinal, explanatory investigation constituted the research design used [28]. Archival data were used to answer the research questions previously discussed. Both the independent variables and the dependent variables to be used in this investigation had already occurred and extraneous variables were not controlled in this study design [29]. The independent variable was the specific academic year in which data on developmental education in writing were available. The dependent variables were (a) the number of students who were enrolled in developmental education writing in each of the academic years, (b) the percentage of students enrolled in developmental education writing out of the total student enrollment, and (c) the percentages of students who completed a college-level course in writing.

### 2.2. Participants and Instrumentation

Archival data were obtained from the 2002-2003 through the 2009-2010 academic years from the [30] for all students at Texas 4-year universities who first enrolled in a developmental education course and then enrolled in a college-level course in writing. Success rates and trends of 4-year universities from the 2002-2003 through the 2009-2010 academic years were determined. All available data were analyzed; data were not available for some universities.

Data for this study were downloaded from the Texas

Higher Education Coordinating Board Accountability System, the Texas Higher Education Coordinating Board Developmental Education Accountability Measures Data website. The [30] is used to track performance of Texas universities on issues considered essential to the success of higher education. For this study, data specifically regarding developmental education courses in writing of students enrolled in 4-year Texas universities were analyzed. Developmental education is defined by the Texas Higher Education Coordinating Board as “courses, tutorials, laboratories, or other efforts to bring students’ skill levels in reading, writing, and mathematics to entering college level” [30, p. 25]. For this study, only college-level courses completed with a grade of A, B, or C were examined according to the data provided by the [30]. Inferential statistical procedures were used to determine whether trends existed from the 2002-2003 through the 2009-2010 academic years regarding developmental course completion and subsequent college-level course completion.

## 3. Results

Regarding the first research question, descriptive statistics were calculated for the numbers of students who were enrolled in developmental education in writing at Texas 4-year universities for the 2002-2003 academic year through the 2009-2010 academic year. The first year of the study, 2002-2003, and the final year of the study, 2009-2010, had nearly the same number of students enrolled, 4,927 and 4,940, respectively. Of particular note to readers was the 2006-2007 academic year had the fewest students ( $n = 2,629$ ) who were enrolled in developmental education in writing, more than 50% less than the highest number of students ( $n = 4,940$ ) who were enrolled in the final year of this study. Readers are directed to Table 1 for these descriptive statistics for the numbers of students who were enrolled in developmental education in writing in Texas 4-year universities from the 2002-2003 through the 2009-2010 academic year.

**Table 1.** Descriptive Statistics for the Number of Students Below State Standards in Writing at Texas 4-year Universities From the 2002-2003 Through the 2009-2010 Academic Year.

Academic Year	n of 4-year universities	M	SD	Sum
2002-2003	31	158.94	215.12	4,927
2003-2004	32	149.50	178.95	4,784
2004-2005	31	132.10	134.53	4,095
2005-2006	31	114.94	116.25	3,563
2006-2007	32	82.17	87.18	2,629
2007-2008	32	96.56	101.64	3,090
2008-2009	34	137.44	158.06	4,673
2009-2010	36	137.22	167.29	4,940

Regarding the second research question, data available on the Texas Higher Education Coordinating Board Interactive Accountability System were not the percentages of students who were enrolled in developmental education in writing. The data that were available and that were analyzed herein were the percentages of students who were not enrolled in

developmental education in writing. Because the focus of the second research question was the percentages of students who were enrolled in developmental education in writing, average percentages were subtracted from 100% in each academic year. Produced were the calculations for the percentages of students who were enrolled in developmental education in writing. Reflected in Table 2 are the descriptive statistics for the percentages of students who were enrolled in developmental education in writing.

**Table 2.** Descriptive Statistics for the Percent of Developmental Education Students Who Met the TSI Obligation in Writing at Texas 4-year Universities From the 2002-2003 Through the 2009-2010 Academic Year.

Academic Year	n of 4-year universities	M%	SD%
2002-2003	31	40.00	20.00
2003-2004	30	38.88	19.33
2004-2005	30	33.88	19.22
2005-2006	31	27.19	13.76
2006-2007	31	24.27	15.14
2007-2008	31	18.06	16.03
2008-2009	32	29.62	19.83
2009-2010	33	27.17	17.94

In the 2004-2005 academic year, the highest average percentage of students ( $M = 47.84\%$ ) were enrolled in developmental education in writing. The highest percentage of students ( $M = 40.00\%$ ) who were enrolled in developmental education in writing was in the first year of the study, the 2002-2003 academic year. Readers should note that the lowest percentage of students enrolled occurred in the 2007-2008 academic year. This percentage of students was more than 50% lower than in the first year of the study.

Regarding research question three, inferential statistics were conducted to determine whether differences were present in the average number of students who were enrolled in developmental education in writing between the 2002-2003 academic year and the 2009-2010 academic year at Texas 4-year universities. Checks were conducted to determine the extent to which these data were normally distributed [31]. Even though some of the values were reflective of non-normal data, a parametric dependent samples  $t$ -test was used to answer the third research question. A statistically significant difference was not present in the average number of students who were enrolled in developmental education in writing,  $t(30) = 0.00$ ,  $p = 1.00$ , between the 2002-2003 and 2009-2010 academic year. In both academic years, the average numbers of students enrolled in developmental education in writing were very similar, reflecting no changes from the first year of the study to the final year of the study. Readers are directed to Table 3 for the descriptive statistics for this analysis.

**Table 3.** Descriptive Statistics for the Average Number of Students Who Were Enrolled in Developmental Education in Writing in the 2002-2003 and the 2009-2010 Academic Year at Texas 4-year Universities.

Academic Year	n of 4-year universities	M	SD
2002-2003	31	158.94	215.12
2009-2010	31	158.94	170.71

To answer the fourth research question, a parametric

dependent samples  $t$ -test was used. A statistically significant difference was yielded in the average percent of students who were enrolled in developmental education in writing,  $t(29) = -4.17$ ,  $p = .001$  between the 2002-2003 academic year and the 2009-2010 academic year at Texas 4-year universities. This difference represented a large effect size (Cohen's  $d$ ) of 0.84 [32]. In the 2009-2010 academic year, the final year of the study, more than a 15% increase was present in the percentage of students enrolled in developmental education in writing when compared to the first year of the study, the 2002-2003 academic year. Delineated in Table 4 are the descriptive statistics for this analysis.

**Table 4.** Descriptive Statistics for the Average Percent of Students Who Were Enrolled in Developmental Education in Writing in the 2002-2003 and the 2009-2010 Academic Year at Texas 4-year Universities.

Academic Year	n of 4-year universities	M%	SD%
2002-2003	30	59.01	19.67
2009-2010	30	74.55	17.19

Regarding the fifth research question, descriptive statistics were calculated for the percentages of students who were enrolled in developmental education in writing and who completed a college-level course in writing at Texas 4-year universities for the 2002-2003 academic year through the 2009-2010 academic year. The final three years of this investigation revealed the highest percentages of students who completed a college-level course in writing. However, readers should note a relatively limited improvement in the percentages of developmental education students who completed a college-level writing course from the first year of the study to the final year of the study, only a 6% increase. Readers are directed to Table 5 for these descriptive statistics.

**Table 5.** Descriptive Statistics for the Percent of Developmental Education Students Who Earned a Grade of A, B, or C in a College-level Course in Writing at Texas 4-year Universities From the 2002-2003 Through the 2009-2010 Academic Year.

Academic Year	n of 4-year universities	M%	SD%
2002-2003	31	48.19	17.05
2003-2004	30	52.92	18.64
2004-2005	30	54.01	17.18
2005-2006	31	52.00	19.53
2006-2007	31	49.96	17.00
2007-2008	31	64.74	20.20
2008-2009	32	59.20	21.15
2009-2010	34	59.44	17.14

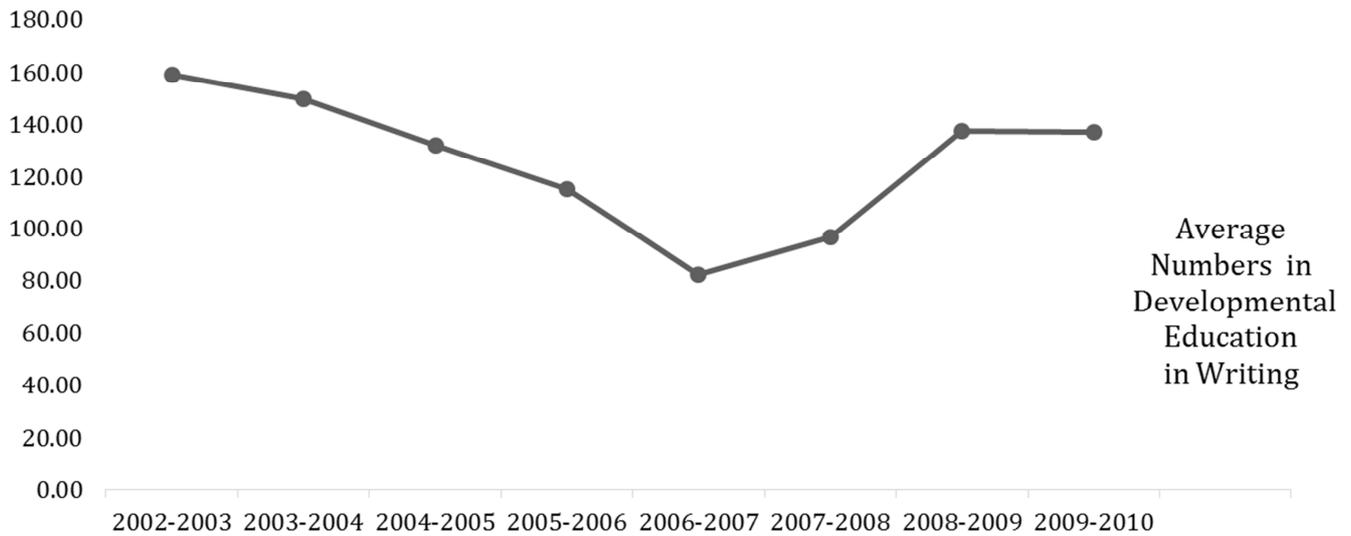
To answer the sixth research question, checks were conducted to determine the extent to which these data were normally distributed [31]. Although some values were indicative of non-normally distributed data, a parametric dependent samples  $t$ -test was used. A statistically significant difference was revealed in the percentage of students who were enrolled in developmental education in writing and who completed a college-level course in writing,  $t(29) = -3.07$ ,  $p = .005$ , between the 2002-2003 academic year and the 2009-2010 academic year at Texas 4-year universities. This difference represented a moderate effect size (Cohen's  $d$ ) of 0.74 [32]. A statistically significantly higher percentage of

students, an increase of 13%, were enrolled in developmental education in writing and completed a college-level course in writing in the 2009-2010 academic year than in the 2002-2003 academic year. Reflected in Table 6 are the descriptive statistics for this analysis.

**Table 6.** Descriptive Statistics for the Percent of Students Enrolled in Developmental Education in Writing at Texas 4-year Universities and Who Completed a College-level Course in Writing in the 2002-2003 and 2009-2010 Academic Year.

Academic Year	n of 4-year universities	M%	SD%
2002-2003	30	47.71	17.13
2009-2010	30	59.62	15.21

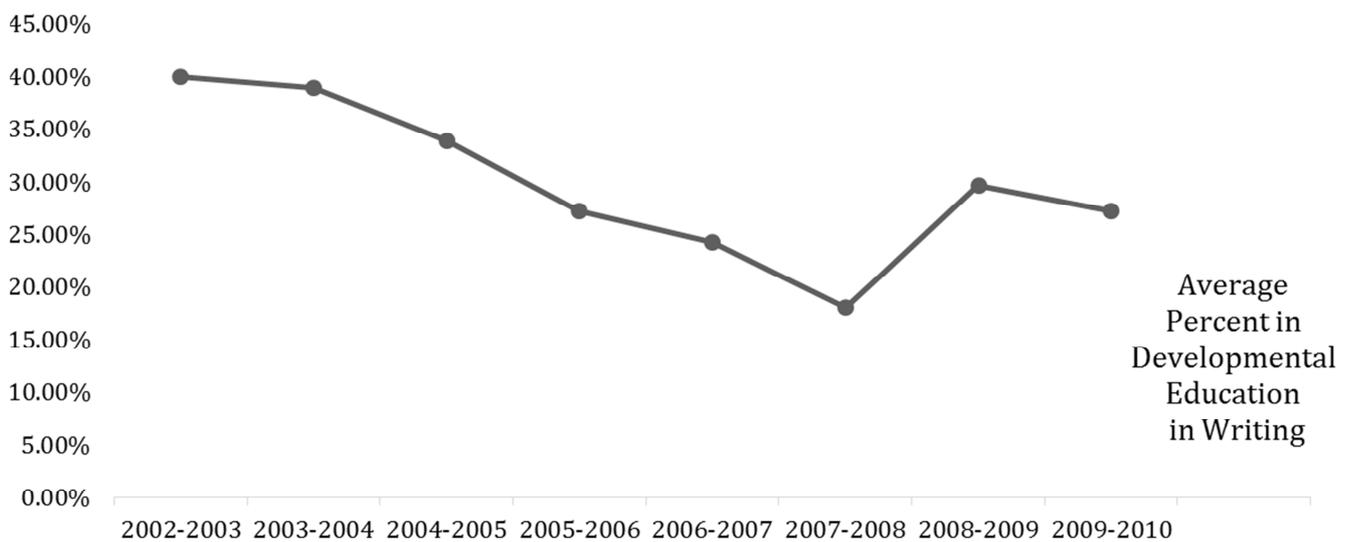
To answer research questions seven, eight, and nine, figures were generated to determine the degree to which trends were present. With respect to research question seven, as revealed in Figure 1, was that average numbers of students who were enrolled in developmental education in writing decreased from the 2002-2003 academic year to the 2006-2007 academic year. However, in the last three years of the study, the average numbers of students who were enrolled in developmental education in writing increased. The numbers of students enrolled in developmental education in writing were nearly the same for the last two years of the study.



**Figure 1.** Average numbers of students who were enrolled in developmental education in writing at Texas 4-year universities for the 2002-2003 through the 2009-2010 academic years.

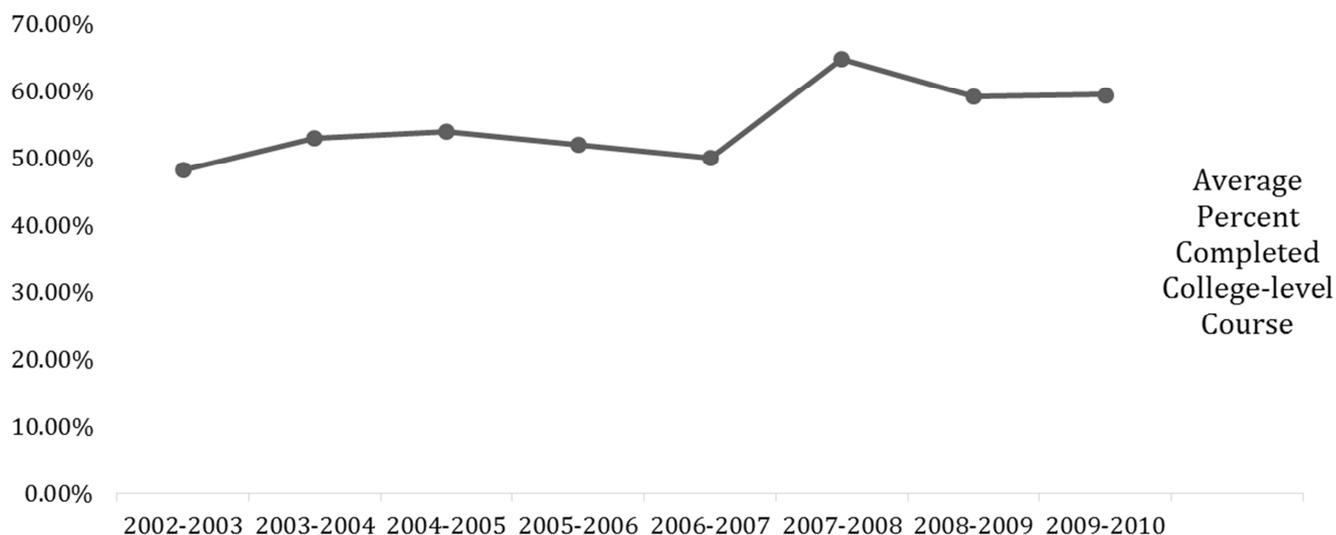
Depicted in Figure 2 is that the percentages of students who were enrolled in developmental education in writing decreased for first six years of the study. The percentages of students who were enrolled in developmental education in

writing then increased in the 2008-2009 academic year. A slight decrease was observed in the percentages of students who were enrolled in developmental education in writing in the final year of the study, the 2009-2010 academic year.



**Figure 2.** Average percent of students who were enrolled in developmental education in writing at Texas 4-year universities for the 2002-2003 through the 2009-2010 academic years.

Shown in Figure 3 are the average percentages of students for the 2002-2003 academic year through the 2006-2007 academic year. The percentages of developmental students who completed a college-level course in writing increased by



*Figure 3. Average percent of students who were enrolled in developmental education in writing and who completed a college-level course in writing at Texas 4-year universities for the 2002-2003 through the 2009-2010 academic years.*

## 4. Discussion

In this multiyear, statewide analysis, data were examined on students who were enrolled in developmental education in writing at Texas 4-year universities in the 2002-2003 through the 2009-2010 academic years. The Texas Higher Education Coordinating Board Interactive Accountability System data were analyzed over an 8-year period. From the 2002-2003 through the 2009-2010 academic years, at least 30 Texas 4-year universities provided data that were analyzed.

Regarding the eight years of data analyzed, statistically significant differences were not present in the numbers of students who were enrolled in developmental education in writing. In this investigation, the average number of students enrolled in developmental education in writing was nearly the same at the beginning of the study ( $n = 4,927$ ) and at the completion of the study ( $n = 4,940$ ). However, for both the percentages of students enrolled and the students who then completed a college-level course in writing, statistically significant differences were present. The lowest average percentage of students enrolled in developmental education in writing was 18% in the 2007-2008 academic year. The highest average percentage was 40% in the 2002-2003 academic year, the first year of the study. The average percentage of students in developmental education who completed a college-level course in writing was the lowest, 48%, in the first year of the study (i.e., 2002-2003), and was the highest, 65%, in the 2007-2008 academic year.

### 4.1. Connections with Existing Literature

Previous researchers [27, 33] have analyzed data on students who were enrolled in developmental education in

more than 10% in the 2007-2008 academic year. However, in the final two years of the study, the 2008-2009 and 2009-2010 academic years, the percentages of students who completed a college-level course in writing decreased.

writing. In this 8-year investigation, the percentages of students enrolled in developmental education in writing at Texas 4-year universities decreased over time. Results of this study were not congruent with [33] wherein percentages of students enrolled in developmental education in writing at community colleges in Texas were higher. According to [33], nearly 60% of students were enrolled in developmental education in writing in the 2002-2003 academic year. This percentage is 20% higher than the percentage of students who were enrolled in developmental education in writing at Texas 4-year universities during that same academic year. This difference might indicate that 4-year university students are better prepared for the challenges of college writing than their counterparts at community college.

[27] determined that community college students enrolled in a developmental course in writing did not persist through college courses any better than students who did not complete developmental writing courses. Completing these courses had no effect on student completion of a certificate or a degree as well. [27] identified some positive effects on student achievement after students completed developmental courses in writing; however, the gains were minimal. [27]'s results differed somewhat from this study, which indicated a 10% improvement in the percentages of students who completed a college-level course in writing from the 2002-2003 academic year to the final year of the study. Nearly 60% of developmental education students completed a college-level course in writing in the 2009-2010 academic year. Because the focus of this study was on Texas 4-year university students rather than on community college students, this difference in postsecondary settings might have led to disparate results.

## 4.2. Implications for Policy and Practice

In this analysis, the numbers of students enrolled in developmental education in writing at Texas 4-year universities remained nearly the same from the 2002-2003 academic year to the 2009-2010 academic year. Unfortunately, these similar numbers indicate that minimal improvements have transpired in preparing students for college writing. Because nearly 40% of students who enrolled in a developmental education course did not complete a college-level course in writing in the final year of the study, Texas 4-year universities must provide improved remediation for students who struggle with college writing.

[33] suggested that too many variables were used to determine the college readiness of Texas college students, which shortchanged students who needed developmental education. With new Texas Success Initiative guidelines implemented in 2003, institutions were able to set their own standards for developmental education status. Too many underprepared students were allowed to exempt developmental courses [33]. Policymakers should reevaluate the standards by which students are placed into developmental education, and they should consider the validity of the variety of exemptions provided to students. [27] emphasized that institutions should focus more specifically on their responsibilities for student success. Higher education administrators must prioritize developmental education students by creating effective courses taught by instructors who have specific training in helping underprepared students. For many students, developmental education is their only opportunity for success in college [27].

## 4.3. Recommendations for Future Research

Examined in this 8-year, statewide investigation were the numbers and percentages of developmental education students in writing at Texas 4-year universities. However, this study could be extended to developmental education students in reading to determine whether similarities or differences among results reported in this study differed. The study could also be extended to developmental education in mathematics. The extent to which results from this study on students in developmental education in writing might generalize to students in developmental education in reading or in mathematics is not known. This study could also be replicated in other states to ascertain the extent to which findings delineated herein are generalizable to other states. Comparing these results to community colleges in both Texas and in other states is another suggestion for future research. Would results from community colleges present differences or similarities when compared to results of this study?

Not considered in this investigation were student demographic characteristics in relationship to student enrollment and student success in developmental education. Studies in which student demographic characteristics such as ethnicity/race, gender, first time in college status, and first generation student are examined with respect to

developmental education are encouraged. Researchers are also encouraged to investigate different types of methods of providing developmental education, such as condensed courses, and whether these variations affect student success.

## 5. Conclusion

The extent to which differences were present in the numbers and percentages of students enrolled in developmental education in writing at Texas 4-year universities from the 2002-2003 academic year through the 2009-2010 academic year was the focus of this research study. The numbers of students enrolled in developmental education in writing were nearly the same from the first year of the study to the final year of the study. Percentages of students enrolled in developmental education in writing decreased over time. Students who were enrolled in developmental education in writing and who completed a college-level course in writing increased slightly more than 10% during the eight years of the study. Because the numbers of students enrolled did not change, and 40% of students did not complete a college-level course, much potential for improvement exists.

[33] suggested that Texas policymakers reconsider the wide range of exemptions that allow unprepared students to bypass developmental education. Many students will not succeed in college without remediation. With nearly 70% of students failing to meet the [8]'s college readiness standards in writing, lacking proficiency in writing is an educational crisis. Universities must improve the quality of developmental education courses, and they must ensure that each student who needs developmental education actually receives it.

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