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Differences in Career and Technical Education Coherent Sequence Graduates Between Students in Special Education and Students in Poverty

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Abstract: The purpose of this study was to examine the extent career and technical education (CTE) coherent sequence enrollment of students in special education and students in poverty differed from the 2013-2014 school year to the 2014-2015 school year. Data included approximately 900 schools for students in special education and approximately 1,400 schools for students in poverty. Inferential statistical analyses revealed that CTE coherent sequence graduates statistically significantly increased from the 2013-2014 school year to the 2014-2015 school year. The increase in CTE coherent sequence graduates is most likely attributable to the implementation of Texas HB-5 in the 2014-2015 school year. Implications of our findings and recommendations for further research were discussed.

Keywords: CTE Coherent Sequence graduates, Special Education, Students in Poverty, Texas HB-5

1. Introduction

College and career readiness has been at the center of the latest education reform because many researchers [1-4] have shown that most adolescent students are not ready for the demands of life when they exit high school. The period of adolescence is critical in a person's life, and it is during this time that teenagers begin making important decisions regarding their career path. How teenagers handle the transition from high school to adulthood is governed by the systems put in place to help guide them while they are in high school. Researchers [5, 6] have argued that enrollment in career and technical education (CTE) courses while in high school produce positive results for adolescents, specifically students in special education and students in poverty.

Focusing on preparing students for life after high school, [7] conducted a study to determine the current framework in place to help transition students from high school to work and if this framework had any implications on students' vocational or career decisions. The authors selected a group of individuals between the ages of 14 to 15, all of whom were in the ninth grade. Mortimer et al. [7] analyzed the questionnaires given to the participants and came up with five categories of career aspirations (i.e., no change in career aspiration, one change in career aspiration, recent change in career aspiration, failed to answer question on career aspirations, and failed to fill out the survey). Three themes emerged from the interviews: age expectations when it comes to life experiences, delay of careers, and obstacles to achieving career goals. One interesting finding was that comments regarding counselors tended to be negative. High school counselors tended to focus their attention on highly skilled students pursuing postsecondary education at a university. Because of this finding, [7] suggested that systems need to be strengthened at the high school level in regard to vocational counseling.

Similarly, [4] conducted a study to expand on previous research regarding the transition from high school into adulthood to determine if changes in career planning, decision, and confidence have an effect on life adjustment post high school. Stringer et al. [4] discovered that the amount of time students spent preparing for their future careers directly correlated to their adjustment in future years; career confidence seemed to be a key component to career preparation when it came to life adjustment after high school.

The authors noted that the study lacked participants who dropped out of high school, so future research should be performed to address how to aide these individuals in making career decisions.

Additionally, [8] surveyed 506 students in Queensland, Australia to gain a greater understanding of the development of students who were strictly work-bound after high school. Creed et al. [8] reported that when work-bound students were compared to university- or college-bound students they were the least prepared for life after high school; work-bound students had lower self-esteem and were less satisfied with the school environment than students who were university- or college-bound. These results of this study support the idea that policy makers should look into training programs to help support students whose aspirations after high school are focused on immediately attaining a career.

Although CTE programs have positively influenced students, [5] examined the impact prior CTE coursework, academic achievement variables, and demographic factors had on participation in career academies for one school district in Florida for the 2012-2013 school year. The authors determined that students of higher economic status enrolled in the career academies at a higher rate than did students of lower economic status. These results were comparable to previous studies regarding overall CTE programs.

With a focus on special education, [6] explored the perceptions of special education teachers and CTE teachers concerning the communication and collaboration present concerning students in special education. Schmalzried and Harvey [6] discovered that a large majority of the respondents felt as though a large gap in communication between special education teachers and CTE teachers existed. Although the teachers felt that communication was important, they reported not always communicating often or effectively with regard to their students with disabilities. Furthermore, the teachers reported having little knowledge regarding students in special education and expressed that the communication often used. Schmalzried and Harvey [6] implied that this information was critically important to policymakers as adequate CTE programs lead to high school completion and career opportunities for students with disabilities.

1.1. Background

House Bill 5 in Texas. Because of the need for more alignment between education and commerce, the 83rd Texas Legislature passed House Bill 5 (HB-5) in 2013. This bill established the new Foundation High School Program as the graduation program for all students entering high school beginning in the 2014-2015 school year [9]. In January 2014, the State Board of Education adopted the rules surrounding the Foundation High School Program and the commissioner of education in Texas adopted a transition plan for HB-5.

House Bill 5 was originally written by Lt. Governor Dan Patrick and state Representative Jimmie Don Aycock. Their aim was to align education and industry and provide coursework that aligned with not just college readiness but career readiness as well [10]. Because American schools were not producing educated students capable of entering a workforce with increasing technical demands, the HB-5 received support from many Americans seeking reform between education and industry. The changes enacted by HB-5 seek reform in three areas: coursework (i.e., provides flexibility for students to pursue their interests), assessment (i.e., reduces amount of standardized testing to evaluate student performance), and accountability (i.e., provides more in depth school ratings).

The Foundation High School Program with endorsements is a flexible plan with endorsements that allows students to pursue their interests [11]. The foundation requirements include the following: four credits of English, three credits of mathematics, three credits of science, three credits of social studies, two credits of languages other than English, one credit of Physical Education, one credit of fine arts, five elective credits, and four credits in the endorsement area for a total of 26 credits. To be admitted to a Texas public university under the Top 10 percent automatic admission law, students must earn the Distinguished Level of Achievement which includes the Foundation Program requirements plus four credits in mathematics, four credits in science, and at least one endorsement.

According to the [11], Students are required to select an endorsement in the ninth grade. They may choose from five endorsement areas: Science, Technology, Engineering, and Mathematics (computer science, mathematics, science, or a combination of no more than two of the previous categories listed); Business and Industry (agriculture, food, and natural resources; architecture and construction; arts, audio/video technology and communication; business management and administration; finance; hospitality and tourism; information technology; manufacturing; marketing; technology applications; transportation, distribution and logistics); Public Services (human services, law, corrections and security, health science, public safety, education and training, government and public administration, and junior reserve officer training corps); arts and humanities (two levels each in two languages other than English, four levels in the same language other than English, courses from one or two areas in fine arts, English electives not included in business and industry, social studies, and American Sign Language); and multi-disciplinary studies (four advanced courses from other endorsement areas, four credits in each foundation subject area, or four credits in advanced placement, international baccalaureate, or dual credit).

1.2. Problem of the Study

In today's highly competitive workforce, all students need to complete high school successfully with the necessary skills needed to be an employee in the field they desire [6]. Because policymakers have taken an interest in college readiness, a tremendous skill gap has occurred in schools nationwide for students who desire to enter the workforce following high school [12]. This skills gap has become increasingly evident in youth with disabilities and students

with a low socioeconomic status [5, 6].

1.3. Purpose of the Study

The purpose of this study was to determine the degree to which the percentage of CTE coherent enrollment of students in special education and students in poverty changed from the 2013-2014 school year to the 2014-2015 school year in Texas. Given the adoption of House Bill 5 by the Texas Legislature in 2013 and its focus on increasing CTE coherent sequence graduates, the extent to which the percentage of CTE coherent sequence graduates actually changed from the 2013-2014 school year to the 2014-2015 school year needs to be determined. Furthermore, this study will add to the needed literature surrounding career readiness for high school students.

1.4. Significance of the Study

This research study is important because the information that will be obtained will add to the limited body of knowledge currently available on career readiness, specifically for students in special education and students in poverty. Furthermore, the results of this study will provide assessment on the implementation and efficacy of HB-5 for Texas, specifically for students enrolled in special education and students in poverty. Analysis of the given data should give insight to policy makers on whether implementation of HB-5 has increased the number of CTE coherent sequence graduates across Texas.

1.5. Research Questions

For this research study, four research questions were addressed: (a) What is the difference between CTE coherent sequence graduates in special education versus all CTE coherent sequence graduates for Texas high schools for the 2013-2014 school year?, (b) What is the difference between CTE coherent sequence graduates in special education versus all CTE coherent sequence graduates for Texas high schools for the 2014-2015 school year?, (c) What is the difference between CTE coherent sequence graduates as a function of economic status for all Texas high schools for the 2013-2014 school year?, and (d) What is the difference between CTE coherent sequence graduates as a function of economic status for all Texas high schools for the 2014-2015 school year?

2. Method

2.1. Research Design

A causal-comparative research design was used for this study. Johnson and Christensen [13] explained causal-comparative research as quantitative research where the researcher seeks to find a relationship between the independent variable and the dependent variable(s). For this study, the independent variable for the first two research questions was students who were enrolled in special education, while the independent variable for the remaining research questions was students in poverty. The dependent variable for all four research questions was whether or not a student completed high school as a CTE coherent sequence graduate. These data are publicly available archival data at the Texas Education Agency website.

2.2. Participants and Instrumentation

For this study, data were extracted from the Texas Education Agency from the Texas Academic Performance Report for the 2013-2014 school year and the 2014-2015 school year. Data are pulled together yearly for the Texas Academic Performance Report in Texas; all data for this report were aggregated at the campus level. For the 2013-2014 school year, 898 schools provided data on their CTE coherent sequence graduates who were enrolled in special education, whereas 1,386 schools provided data on CTE coherent sequence graduates who were economically disadvantaged. Regarding CTE coherent sequence graduates for the 2014-2015 school year, 900 schools provided data on students who were enrolled in special education, whereas 1,418 schools provided data on students in poverty.

According to the [14], a CTE coherent sequence graduate is a graduate "enrolled in a coherent sequence of career and technical education (CTE) courses as part of a four-year plan of study" (p. 8). For this study, analysis was conducted for data on CTE coherent sequence graduates enrolled in special education and CTE coherent sequence graduates in poverty. The [14] reported through the Texas Education Agency website defined special education as "a population of students served by special education programs" (p. 22), whereas economically disadvantaged is defined as "students eligible for free or reduced-price lunch or eligible for other public assistance" (p. 10). It is important that the readers know the context of these keywords to provide a more in depth understanding of the study.

3. Results

After calculating the standardized skewness coefficients (i.e., the skewness value divided by its standard error) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by its standard error), five out of 12 of the coefficients were within normal limits, +/- 3 [15]. Although only five of the standardized coefficients were determined to be normally distributed, a decision was made to conduct a parametric dependent samples *t*-test to answer the four research questions. When the variables are related (i.e., CTE coherent sequence graduates), parametric dependent samples *t*-tests are the appropriate inferential statistical technique [16]. For this study, CTE coherent sequence graduate data for the Texas were at the interval/ratio level of measurement and were available for the same groups of students for all four research questions.

For the first research question for the 2013-2014 school year, the dependent samples *t*-test analysis produced a statistically significant difference between CTE coherent sequence graduates in special education and all CTE coherent

sequence graduates, $t(897) = 60.84$, $p < .001$, Cohen's $d = 2.54$, a large effect size [17]. The rate of CTE coherent sequence graduates in special education was statistically significantly lower than the rate of all students. A 49.46% difference was present between CTE coherent sequence graduates in special education and CTE coherent sequence grades of all students in Texas. Readers are directed to Table 1 for the descriptive statistics for this analysis.

Table 1. *Descriptive Statistics for CTE Coherent Sequence Graduates in Special Education Compared to All CTE Coherent Sequence Graduates in Texas for the 2013-2014 School Year.*

Student Group	*n* of schools	*M%*	*SD%*
Special Education	898	5.81	5.71
All Students	898	55.27	26.91

With respect to the 2014-2015 school year, the dependent samples *t*-test analysis again produced a statistically significant difference between CTE coherent sequence graduates in special education and all CTE coherent sequence graduates, $t(899) = 2.20$, $p = .028$, Cohen's $d = 0.04$, a less than small effect size [17]. The rate of CTE coherent sequence graduates in special education was statistically significantly lower when compared to the rate of all students graduating as CTE coherent sequence graduates with a mean difference of 1.14%. Table 2 contains the descriptive statistics regarding this analysis.

Table 2. *Descriptive Statistics for CTE Coherent Sequence Graduates in Special Education Compared to All CTE Coherent Sequence Graduates in Texas for the 2014-2015 School Year.*

Student Group	*n* of schools	*M%*	*SD*
Special Education	900	54.80	28.65
All Students	900	55.94	26.97

For the third research question for the 2013-2014 school year, the dependent samples *t*-test analysis generated a statistically significant difference between CTE coherent sequence graduates as a function of economic status, $t(1385) = 52.76$, $p < .001$, Cohen's $d = 1.08$, a large effect size [17]. The rate of CTE coherent sequence graduates in poverty was statistically significantly lower when compared to the rate of all students graduating as CTE coherent sequence graduates. A mean difference of 27.60% was present between the two groups of students. Readers are referred to Table 3 for the descriptive statistics of this analysis.

Table 3. *Descriptive Statistics for CTE Coherent Sequence Graduates as a Function of Economic Status in All Texas High Schools for the 2013-2014 School Year.*

Student Groups	*n* of schools	*M%*	*SD*
Students in Poverty	1,386	29.20	21.08
All Students	1,386	56.80	29.42

Concerning the 2014-2015 school year, the dependent samples *t*-test did not yield a statistically significant difference between CTE coherent sequence graduates as a function of economic status, $t(1417) = 0.27$, $p = .798$. The rate of CTE coherent sequence graduates in poverty was similar to the rate of all students graduating as CTE coherent sequence graduates. Table 4 contains the descriptive statistics for this analysis.

Table 4. *Descriptive Statistics for CTE Coherent Sequence Graduates as a Function of Economic Status in All Texas High Schools for the 2014-2015 School Year.*

Student Group	*n* of schools	*M%*	*SD*
Students in Poverty	1,418	57.20	29.70
All Students	1,418	57.24	29.70

4. Discussion

High school administrators, high school teachers, and state policymakers in Texas must work together to ensure that adequate planning is occurring for students to have a smooth transition from high school to postsecondary life. Previous researchers [5, 18, 19, 10, 6] have confirmed through their studies that enrollment in CTE coursework is not only a strong indicator of high school completion but also provides for positive outcomes in career attainment following high school. For this study, Texas Academic Performance Report data from the Texas Education Agency were analyzed to investigate the extent that students in special education and students in poverty were enrolled in CTE coherent sequence programs for the 2013-2014 and 2014-2015 school years in Texas.

Career and technical education coherent sequence graduates increased dramatically for both students in special education and students in poverty from the 2013-2014 school year to the 2014-2015 school year. For students in special education in the 2013-2014 school year, only 5.81% of students were considered to be CTE coherent sequence graduates. That percentage improved to 54.80% of students in special education being identified as CTE coherent sequence graduates for the 2014-2015 school year. A notable escalation was present in CTE coherent sequence graduates for students in poverty as well. The number of CTE coherent sequence graduates in poverty increased by 28% from the 2013-2014 school year (i.e., 29.20% considered CTE coherent sequence graduates) to the 2014-2015 school year (i.e., 57.20% considered CTE coherent sequence graduates).

According to the mean difference for both groups (i.e., students in special education and students in poverty), students in special education experienced a greater gain of CTE course enrollment than did students in poverty; however, the gap between students in poverty and all Texas high school students was smaller for the 2013-2014 school year than was the gap for students in special education when compared to all Texas high school students. When examining these two groups compared to all students in Texas, the mean difference was relatively nonexistent for the 2014-2015 between students in special education and students in poverty when compared to all students. Furthermore, a slight increase was present for all Texas high school students who were considered CTE coherent sequence graduates from the 2013-2014 school year to the 2014-2015 school year.

4.1. Recommendations for Future Research

Further research should be conducted to identify if these students were indeed ready to enter into the workforce following their high school career. Through this investigation employers should also be examined to determine whether their employees were adequately prepared for their jobs following the completion of the Foundation High School Program which was implemented as a result of HB-5. This research could be conducted through survey analysis or qualitative procedures like interviews or focus groups. For this study, all data were aggregated at the district level. Researchers should collect individual student data as opposed to campus data to determine more accurate results. Furthermore, researchers in other states should replicate this study to see if similar results occur across the nation.

4.2. Limitations of This Study

Readers should be cautious in the extent to which they make generalizations from this empirical investigation. As noted above, the data that were analyzed herein were aggregated school campus data and not individual student data. Second, only two years of data were analyzed. The degree to which our findings would be generalizable across time is not known. Finally, our results are based entirely on Texas schools. The extent to which other states would have similar findings is not known. Thus, we encourage readers to be tentative in their interpretations of our results, until such time as other studies in this area are conducted.

5. Conclusion

The gains in CTE coherent sequence graduates from the 2013-2014 school year to the 2014-2015 school year can be attributed to the implementation of HB-5 for the 2014-2015 school year. The goal of HB-5 as set forth by the 85th Texas Legislature was aimed at providing career readiness for a larger number of students. The results of the data can be interpreted to mean that the enactment of HB-5 in school districts across Texas did increase the number of students, specifically students in special education and students in poverty, who enrolled in courses geared to educate them in career and technical fields.

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