School Leadership Review

Volume 19 | Issue 1 Article 1

Economic Status Differences in Industry-Based Certification Attainment Rates of Texas High School Graduates: A Multiyear, Statewide Analysis

Robert Todd Hicks
Sam Houston State University, stdrth11@shsu.edu

John R. Slate
Sam Houston State University, jrs051@shsu.edu

Janene W. Hemmen
Sam Houston State University, stdjwh22@shsu.edu

Economic Status Differences in Industry-Based Certification Attainment Rates of Texas High School Graduates: A Multiyear, Statewide Analysis

Cover Page Footnote

This manuscript is part of Robert Todd HIcks journal-ready dissertation conducted under the supervision of Dr. John R. Slate

Introduction

The passing of the Elementary and Secondary Education Act (1965) resulted in public school accountability and the implementation of high-stakes testing. As a result, the United States implemented mandates through state and federal policy designed to improve student performance, yet the nation continued to fall behind competing countries in postsecondary achievement (Davis et al., 2013). Researchers (Harvey et al., 2013) have established that students must develop skills in mathematics and reading while in high school to be prepared for postsecondary education and entry into the workforce. However, students experiencing certain life circumstances (e.g., poverty) have demonstrated difficulty in developing requisite mathematics and reading skills (Chandler et al., 2014; Davenport & Slate, 2019; Tavassolie & Winsler, 2019). These findings are concerning because The United States Census Bureau (Creamer et al., 2022) reported that 37.9 million people were identified to be living in poverty, equating to 11.6% of the population of the United States.

Students who are economically disadvantaged have been documented to perform at lower proficiency levels than their more privileged peers. Lee and Slate (2014) revealed that students who were economically disadvantaged demonstrated statistically significantly lower percentages of Commended Performance and college-readiness on both the Texas English Language Arts and Mathematics state-mandated exams when compared to students who were not economically disadvantaged. Similar evidence was presented by Chandler et al. (2014) from an analysis of college-readiness data for students enrolled in Texas public schools from the 2006-2007 through the 2010-2011 school years. Chandler et al. (2014) established that students who were economically disadvantaged had statistically significantly lower levels of college readiness in reading, mathematics, and both subjects than all students in aggregate. In their analysis of trends across the five years of data analyzed, they also documented that students in poverty increased their college readiness performance in reading, mathematics, and both subjects; however, the group consisting of all students also demonstrated proportional increases in college readiness in the same areas, thus eliminating any potential gap closure between the two groups.

Dougherty (2013) supported the importance of establishing reading and mathematics skills in the primary grades. In 2012, only 30% of students identified to be economically disadvantaged met the college readiness benchmark in reading, whereas 21% met the same standard in mathematics, and 13% met the standard in science in states where all eleventh graders were required to take the ACT. Dougherty (2013) also revealed that gaps in learning appeared at young ages, with some gaps emerging as early as kindergarten. Further noted were that students who struggled at early ages were reported to struggle in the later grade levels. Academic supports determined to be effective in mitigating the development of learning gaps for students living in poverty were programs that developed reading and mathematics skills at early ages, programs that supported strong academic and social development, and early intervention and support systems (Dougherty, 2013).

In an analysis of advanced academic performance, Kim et al. (2017) examined a summer university-based STEM enrichment program designed for high-ability, low-income middle school students. A substantial factor discussed by Kim et al. (2017) was the importance of STEM skills as a contributor to the health of the nation's economy, thus keeping the United States competitive on a global scale. Findings were presented that students lost mathematics skills during the summer, regardless of family income levels. However, children from affluent families demonstrated gains in reading, whereas students in poverty demonstrated losses in reading. Kim

et al. (2017) further documented that pre and post assessments revealed that students gained STEM related skills during the summer enrichment program.

In a related study, Johnson (2020) assessed students' college, career, and military readiness (CCMR), a metric used by the Texas Education Agency (2022b) to predict student preparedness for college, the workforce, or the military. Specifically analyzed were the extent to which differences existed between college, career, and military readiness rates for all students compared to campuses that had high, above average, below average, and low proportions of students identified as economically disadvantaged in the State of Texas. Statistical analyses did not reveal significant differences between the groups. However, presented in the study was that a significant number of students from impoverished backgrounds were graduating from high school CCMR ready. Johnson (2020) further suggested that public school programs and initiatives designed to support students from disadvantaged backgrounds could be performing as intended.

The aforementioned researchers have focused on student performance, however the desire to understand forces that influence poverty has also been a relevant topic for research. In an examination of societal factors contributing to poverty, Homan et al. (2017) presented two distinct predictors of poverty. Specifically, they determined that poverty was viewed as intergenerational poverty and downward mobility. Intergenerational poverty referred to those individuals who were born into poverty and downward mobility referred to those individuals who entered poverty during their life. The researchers associated intergenerational poverty with individuals of color, immigrants, teens, and adults. Downward mobility was associated with Whites, children, and the elderly. In a similar study, McLaughlin and Rank (2018) associated poverty with a loss of human potential and quantified their findings by analyzing certain indicators, such as increased costs for health care, illicit behavior, and loss of economic productivity. The researchers suggested that the physical environment associated with childhood poverty was highly correlated to lower monetary earnings in adulthood. In addition, McLaughlin and Rank (2018) established that childhood poverty had a large negative financial impact on the nation's economy, costing the United States as much as $1.0298 trillion annually - $294 billion of which was directly attributed to reduced earnings.

Developing employability skills while students are in high school provides positive returns to individuals, as well as to the economy. To address the growing demands for skilled labor, Akgunduz and Mesutoglu (2021) recommended that educational institutions collaborate with industry representatives to develop effective educational programs that teach the skills demanded by industry – an approach that benefits students from all backgrounds, including those students in poverty. Goldring (2017) presented a progressive approach to foster the development of industry skills in students by incorporating industry recognized certifications into the curriculum. The Texas Education Agency (2022a) has aligned with such philosophy by incorporating industry-based certifications into Career and Technical course offerings and including the attainment of industry-based certifications in the Texas public school accountability system.

Previous researchers (Chandler et al., 2014; Lee & Slate, 2014) have documented that students from economically disadvantaged backgrounds have performed at lower academic proficiency levels than their more privileged peers. Specifically, lower performance has been established to be present in reading and mathematics (Davenport & Slate, 2019; Tavassolie & Winsler, 2019), content areas that provide foundational skills for Career and Technical Education and advanced STEM career fields. Students in poverty have demonstrated deficits in academic

performance as early as kindergarten (Dougherty, 2013), with specific deficiencies in reading and mathematics appearing in the primary grades (Davenport & Slate, 2019; Tavassolie & Winsler, 2019), and extending into the later grades (Chandler et al., 2014). Developing a proficient understanding in academic skills in all students, especially those individuals in poverty, is of major importance not only to individuals, but also to the health of the nation's economy (McLaughlin & Rank, 2018). Acquisition of industry-based certifications recognized by the Texas Education Agency (2022a) is an indicator of such skill attainment.

Purpose of the Study

The purpose of this study was to ascertain differences that existed by student economic status in the attainment of industry-based certifications offered by the Texas Education Agency for Texas public high school students. Included in this investigation was an analysis of industry-based certifications earned during the 2019-2020, 2020-2021, and 2021-2022 school years. Data sets included in the research were made publicly available by the Texas Education Agency through the Texas Academic Performance Reports. Statistical analyses performed in the study included a comparison of industry-based certifications earned by Texas public high school students who were identified to be economically disadvantaged to all Texas public high school students who earned an industry-based certification. The presentation of trends that existed across the three school years included in the study were discussed. Findings from the study are beneficial to program administrators in the Texas public high school setting who are tasked with making instructional and financial decisions.

Statement of the Problem

It has been reported that the United States has an estimated 37.9 million people living in poverty (Creamer et al., 2022). Further, childhood poverty has been calculated to cost the United States Economy as much as $1.0298 trillion annually, with $294 billion attributed to loss of earnings in adulthood (McLaughlin & Rank, 2018). The emergence of the fourth industrial revolution, known as Industry 4.0, has resulted in a complex dynamic of data sharing, collaboration across multiple information platforms, and automated manufacturing processes (Catal & Tekinerdogan, 2019). As a result, industry leaders have expressed a need for employees who have skills in critical thinking, active learning, problem solving, and self-management (Li, 2022, 4.1).

To offset academic disparities documented to be present by student economic status, Peck (2018), among others, have reinforced the influence teachers have on the acquisition of skills, particularly when focusing on career development. Specifically, Holman et al. (2017) established that the knowledge demanded by industry professionals can be developed in high school through well-planned CTE programs. As such, students in poverty can be provided an opportunity to gain the skills required for high-wage, high-demand career fields, while also reducing the negative financial effects on society.

Significance of the Study

Researchers have documented that differences exist in academic performance between students who were raised in poverty when compared to students who were not raised in poverty (Davenport & Slate, 2019; Tavassolie & Winsler, 2019). Differences have specifically been reported in college readiness performance indicators in reading and in mathematics. A limited body of research studies exist on college, career, and military readiness, whereas scant research articles are available specific to career readiness. Regarding the current study, empirical published research articles exclusive to Texas Education Agency industry-based certifications by

economic status could not be located. However, a substantial number of individuals have expressed a growing need for skilled labor in the current workforce (Li, 2022).

Public education programs in the K-12 sector that provide the requisite skills demanded by industry leaders to high school graduates equip those students with the knowledge to compete for high demand industry positions. Further, providing students from economically disadvantaged backgrounds with the aforementioned skills not only provides them with the cognitive resources to exit impoverished life situations, but also provides positive economic contributions to the US economy. Analysis of attainment of industry-based certifications by Texas high school graduates is necessary because such research findings could provide an understanding of career preparedness necessary for decision-making purposes.

Research Questions

Two research questions were addressed in this multiyear analysis. The first research question involved the extent to which differences were present by student economic status in Texas Education Agency approved industry-based certification attainment rates. This research question was answered independently for the 2019-2020, 2020-2021, and 2021-2022 school years. The second research question was about the degree to which a trend was present in Texas Education Agency approved industry-based certification attainment rates by student economic status. This research question involved a comparison across all three school years of data analyzed herein.

Method

Research Design

This study was a quantitative analysis (Johnson & Christensen, 2020) of the attainment of industry-based certification rates between Texas high school graduates who were identified as being economically disadvantaged and all Texas high school graduates who earned an industry-based certification. Archival data on all high school students in the State of Texas were obtained from the Texas Education Agency. The study was conducted as a causal-comparative research investigation to identify the potential relationship between the independent and dependent variables. Because the data analyzed were archival, specific cause-effect relationships could not be established and generalizations could not be made (Johnson & Christensen, 2020). Though cause and effect relationships cannot be definitively determined, important variables and their relationships can be identified for further investigation. Economic status of the Texas high school graduates served as the independent variable (i.e., economically disadvantaged or not economically disadvantaged) and industry-based certification rates served as the dependent variable.

Participants and Instrumentation

Data analyzed in this study were campus-level data regarding students enrolled at Texas high schools in each of the aforementioned school years. Data on students who graduated from comprehensive Texas public high schools during the 2018-2019, 2019-2020, and 2020-2021 school years and earned an industry-based certification recognized by the Texas Education Agency were examined in this study. Data analyzed were made publicly available from the Texas Education Agency through the Texas Academic Performance Reports for the 2019-2020, 2020-2021, and 2021-2022 school years. Industry-based certification data published in the Texas Academic Performance Reports were from the previous school year, resulting in a one-year reporting lag (e.g., industry-based certifications earned in the 2020-2021 school year were publicized in the 2021-2022 Texas Academic Performance Report) for all campuses and districts in the State of Texas (Texas Education Agency, 2022a).

The Texas Education Agency (2019) identified students to be economically disadvantaged if they qualified for free or reduced price meals or were identified as Other Economic Disadvantaged as specified in the following categories: families who were at or below the federal poverty line, students who qualified for Temporary Assistance to Needy Families (TANF) or other public assistance, students awarded a Pell Grant or assistance from a comparable state financial assistance program, students who qualified for programs assisted under Title II of the Job Training Partnership Act (JTPA), or students from families who were eligible under the Food Stamp Act of 1977. In contrast, students who were not economically disadvantaged did not meet the eligibility criteria specified for students identified to be economically disadvantaged (Texas Education Agency, 2019).

Industry-based certifications earned statewide by students in poverty and industry-based certifications earned by all Texas high school students were the specific variables analyzed in this study. Attainment rates for both student groups were calculated by dividing the number of graduates who earned an industry-based certification for a specific school year by the number of graduates for the same school year (Texas Education Agency, 2022a). Industry-based certification attainment rates were then publicized in the Texas Academic Performance Report.

Results

Data Analysis

Because of the way that the Texas Education Agency reports its data, inferential statistical analyses were limited to parametric dependent samples *t*-tests analyses. That is, the Texas Education Agency links student demographic characteristics (in this case, student economic status) with its dependent variables (in this case, industry-based attainment rates). As such, parametric dependent samples *t*-tests are the correct statistical procedure to calculate because of the linkage of demographic characteristic with attainment rates. Although not all of this procedure's underlying assumptions were met, Field (2018) maintains that the parametric dependent samples *t*-test procedure is robust in nature, allowing for the accommodation of violations to the underlying assumptions. Therefore, parametric dependent samples *t*-tests were conducted to analyze differences in industry-based certification attainment rates by economic status.

Results for Industry-Based Certification Attainment Rates by Economic Status for the 2018-2019, 2019-2020, and 2020-2021 School Years

Industry-based certification attainment rates reported by the Texas Education Agency for the 2018-2019, 2019-2020, and 2020-2021 school years served as the data analyzed in this study. Specifically, differences in industry-based certification attainment rates for Texas high school graduates in poverty to industry-based certification attainment rates for all Texas high school graduates earning certifications were analyzed for statistically significant differences for each of the three school years. Due to the format of the data reported in the Texas Academic Performance Reports, comparisons on economic status could only be made between students in poverty and the entire group of students. Therefore, differences in industry-based certification attainment rates will be presented in the pairing of Texas high school graduates in poverty to all students.

In reference to the 2018-2019 school year, the difference was statistically significant, $t(1822) = 4.97$, $p < .001$. The effect size was less than small, Cohen's $d = 0.12$ (Cohen, 1988). Industry-based certification attainment rates were statistically significantly higher for all students, 0.54% higher, than they were for Texas high school graduates in poverty. A statistically significant difference was present for the 2019-2020 school year, $t(1847) = 5.95$, $p < .001$. The

effect size was less than small, Cohen's $d = 0.14$ (Cohen, 1988). Industry-based certification attainment rates for all students were statistically significantly higher, 0.93% higher, than for Texas high school graduates in poverty. Regarding the 2020-2021 school year, a statistically significant difference was revealed, $t(1879) = 7.80$, $p < .001$, Cohen's $d = 0.18$, a less than small effect size (Cohen, 1988). Industry-based certification attainment rates for all students were statistically significantly higher, 1.41% higher, than were the attainment rates for graduates in poverty. Descriptive statistics for the three school years analyzed are presented in Table 1.

Table 1

Descriptive Statistics by Student Economic Status for the Percentages of Texas High School Graduates who Earned an Industry-Based Certification in the 2018-2019 Through the 2020-2021 School Years

School Year and Comparison	*n* of schools	*M%*	*SD%*
2018-2019			
Economically Disadvantaged	1,823	8.27	13.56
All Students	1,823	8.81	13.61
2019-2020			
Economically Disadvantaged	1,848	10.90	15.86
All Students	1,848	11.83	16.35
2020-2021			
Economically Disadvantaged	1,880	17.29	21.34
All Students	1,880	18.70	21.44

Note. The *n* in the table above denotes the number of high schools included in the study.

Discussion

This statewide, multiyear study included the analyses of industry-based certification attainment rates by economic status. Specifically addressed were attainment rates of Texas high school graduates in poverty compared to attainment rates of all Texas high school graduates earning an industry-based certification. Data analyzed were reported by the Texas Education Agency through the Texas Academic Performance Reports and included industry-based certification attainment rates for students who graduated from comprehensive Texas public high schools in the 2018-2019, 2019-2020, and 2020-2021 school years.

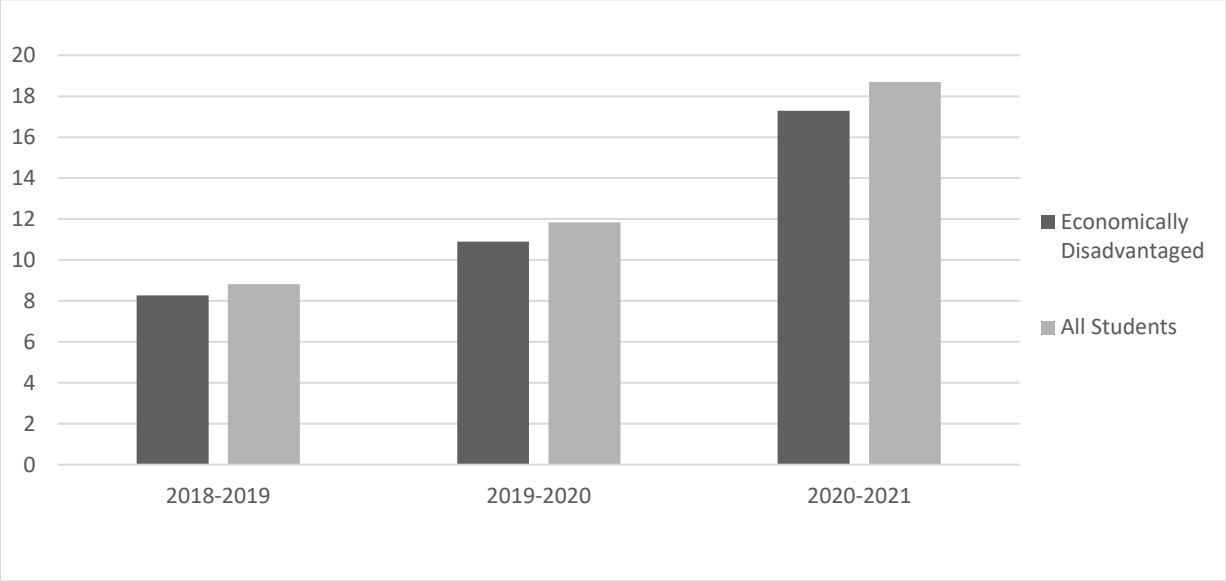
Regarding the 2018-2019 school year, the difference between attainment rates for students in poverty and the all student group was relatively small; 8.27% of students in poverty earned an industry-based certification, compared to 8.81% of all Texas high school graduates. A similar dynamic was present for the 2019-2020 school year. Students in poverty earned industry-based certifications at a rate of 10.90%, compared to the all student group who demonstrated an 11.83% attainment rate. During the 2020-2021 school year, students in poverty obtained a 17.29% attainment rate, whereas the all student group earned industry-based certifications at a rate of 18.70%.

Of particular interest is the similarity in differences between the group of students in poverty and the all student group for the 2018-2019 and 2019-2020 school years. In both years, the all student group had a slightly higher attainment rate than the student group in poverty – 0.54% and 0.93%, respectively. However, a 1.41% difference was observed for the 2020-2021 school year, with the all student group demonstrating higher levels of attainment. Also worth noting is that both student groups demonstrated significant increases in attainment rates for the 2020-2021 school year when compared to the 2019-2020 school year. Students in poverty

increased attainment by 6.39% and the all student group increased attainment by 6.87%. Regardless of the sizable increases in attainment for both groups, it should be noted, as depicted in Figure 1, the attainment gap between students in poverty and the all student group widened by 0.87% across the three years of data analyzed.

Figure 1

Average Percentages by Student Economic Status for Texas High School Graduates who Earned an Industry-Based Certification in the 2018-2019 Through the 2020-2021 School Years



Results from this statewide, multiyear study reflect that students in poverty had consistently lower industry-based certification attainment rates than their peers who were not in poverty across the three school years of data analyzed. These findings are consistent with previous researchers (Davenport & Slate, 2019; Tavassolie & Winsler 2019) who established that students in poverty underperformed academically than their peers who were not in poverty. However, also worth noting, is that although students in poverty had lower industry-based certification attainment rates than the all student group, the difference was small, ranging from less than one percent to just over one percent in the years investigated. This observation is congruent with Johnson (2020) who suggested that educational programs implemented to support students from impoverished backgrounds could be functioning as intended.

Implications for Policy and for Practice

Several implications related to policy and practice emerge from the current study. Primarily, campus and district officials with programmatic decision-making authority must understand that students from impoverished backgrounds have historically underperformed their peers who were not in poverty in academic settings. Therefore, specific support structures must be erected in K-12 education to ensure the continued success of students from economically challenged backgrounds. As such, ongoing monitoring protocols must be implemented to make certain students from economically disadvantaged households are provided information about programmatic offerings, instructional support, and guidance from the time of enrollment in associated programs through completion.

Similarly, state and federal legislatures and agency leaders must understand the strain poverty places on the economic well-being of the country and make calculated decisions to provide life changing opportunities for the citizens of the United States, including those in the

State of Texas. Legislative decisions of this nature can be made through public education. Therefore, legislative officials should provide opportunities for educational programs that incentivize the skills demanded by employers in high wage, high demand career fields. Further, it is imperative that funding mechanisms be established through legislation that provide local education agencies the ability to implement instructional programs that train students in the skills necessary to enter high wage, high demand career fields.

Thoughts from an Educational Leader Perspective

The average person would think that industry-based certifications offered at the high school level would be an opportunity that students who are living in poverty would be enrolled in at a high rate. Findings from this article were that students labeled as economically disadvantaged lag behind students who are not economically disadvantaged with regard to industry-based certification attainment at the high school level. Because program costs are covered by the school district, it would make sense that students in poverty would have an incredible opportunity of gaining a certification that would provide income in their post high school years.

School leaders must ensure the industry-based programs offered are varied and most of all meet the needs of their campus economically disadvantaged population. Additionally, school leaders must ensure that the counseling department makes students who are economically disadvantaged aware of these certifications, how these certifications translate to post high school jobs, as well as the income each industry-based certification job can provide. We have to do a better job of providing and sharing all industry-based certification opportunities to students in poverty, so they have the same chance of setting and meeting post high school goals as those students who are not economically disadvantaged.

Recommendations for Future Research

Multiple opportunities for future research studies arise from the current statewide, multiyear study. Primarily, because data analyzed in this investigation were relegated to the 2018-2019, 2019-2020, and 2020-2021 school years, future investigations could extend beyond these school years. Of particular interest is the observation that the gap between industry-based certification attainment for students who were economically disadvantaged and the all student group grew wider each of the three years analyzed. Expanding this study to include additional school years would provide evidence that the aforementioned trend continued or began to close, thus providing valuable information to programmatic decision makers. An additional extension of this research investigation would be to investigate the metrics established by the Texas Education Agency used to identify college, career, and military readiness to determine how students from impoverished backgrounds are reaching this designation. This evaluation would provide substantial information to both decision makers and policy makers that could be used to better support students experiencing economically challenging life situations.

Conclusion

This statewide, multiyear investigation included the analyses of industry-based certification attainment rates by student economic status for the 2018-2019, 2019-2020, and 2020-2021 school years. Students who were economically disadvantaged had statistically significantly lower industry-based certification attainment rates than all Texas high school graduates during the school years analyzed. Although the differences were not tremendous, the gap in attainment did grow at an increasing rate across the three years of data studied. Disparate trends in industry-based certification attainment rates revealed in this study provide programmatic decision makers and policymakers with the evidence needed to shape policies and

programs in ways that provide students from economically challenged backgrounds with the skills necessary to enter high wage, high demand career fields, while also positively affecting the economy of the United States.

References

Akgunduz, D., & Mesutoglu, C. (2021). Science, technology, and mathematics education for Industry 4.0 in technical and vocational high schools: Investigation of teacher professional development. *Science Education International, 32*(2), 172-181. https://doi.org/10.33828/sei.v32.i2.11

Catal, C., & Tekinerdogan, B. (2019). Aligning education for the life sciences domain to support digitalization and Industry 4.0. *Procedia Computer Science, 158*, 99-106. https://doi.org/10.1016/j.procs.2019.09.032

Chandler, J. R., Slate, J. R., Moore, G. W., & Barnes, W. (2014). College-readiness rates of students with special learning needs in Texas public schools. *Journal of Education and Human Development, 3*(2), 67-103. http://jehdnet.com/journals/jehd/Vol_3_No_2_June_2014/6.pdf

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erbaum.

Creamer, J., Shrider, E. A., Burns, K., & Chen, F. (2022). *Poverty in the United States: 2021*. [Current Population Reports, 60-277]. U.S. Census Bureau. https://www.census.gov/content/dam/Census/library/publications/2022/demo/p60-277.pdf

Davenport, G. C., & Slate, J. R. (2019). Poverty and mathematics performance of Texas Grade 3 students: A cause for concern. *Bulletin of Education and Research, 41*(3), 167-176. https://files.eric.ed.gov/fulltext/EJ1244688.pdf

Davis, C. M., Slate, J. R., Moore, G. W., & Barnes, W. (2013). College readiness and Black student performance: Disaffirmed equity. *The Online Journal of New Horizons in Education, 3*(4), 23-44. https://www.tojned.net/journals/tojned/articles/v03i04/v03i04-03.pdf

Dougherty, C. (2013). *College and career readiness: The importance of early learning.* [Policy Report]. ACT. https://www.act.org/content/dam/act/unsecured/documents/ImportanceofEarlyLearning.pdf

Elementary and Secondary Act. (1965). Pub. L.Tooltip Public Law (United States) 89-10

Field, A. (2018). *Discovering statistics using SPSS* (5th ed.). Sage.

Goldring, D. (2017). Pathways for 21st century learners: Integrating industry-based certifications into the marketing curriculum. *Journal of Higher Education Theory and Practice, 17*(1), 33-38. https://articlegateway.com/index.php/JHETP/article/view/1574/1502

Harvey, D. W., Slate, J. R., Moore, G. W., Barnes, W., & Martinez-Garcia, C. (2013). College readiness gaps: A review of the literature. *Journal of Education Research, 7*(3), 181-204.

Holman, A. G., Kupczynski, L., Mundy, M-A., & Williams, R. H. (2017). CTE students' perceptions of preparedness for post-secondary opportunities. *The CTE Journal, 5*(2), 8-23. https://www.thectejournal.com/uploads/1/0/6/8/10686931/volume_5_number_2_thectejournal.pdf

Homan, P., Valentino, L., & Weed, E. (2017). Being and becoming poor: How cultural schemas shape beliefs about poverty. *Social Forces, 95*(3), 1023-1048. https://doi.org/10.1093/sf/sox007

Johnson, T. (2020). *Comparison of proportion of Texas campus college, career, and military readiness of all students to the proportion of Texas campus college, career, and military*

readiness by ethnicity/race, gender, and economic status: A Texas statewide study [Doctoral dissertation, Sam Houston State University]. Scholarly Works @ SHSU. https://shsu-ir.tdl.org/handle/20.500.11875/2915

Johnson, R. B., & Christensen, L. (2020). *Educational research: Quantitative, qualitative, and mixed methods approaches* (7th ed.). Sage.

Kim, M., Cross, J., & Cross, T. (2017). Program development for disadvantaged high-ability students. *Gifted Child Today, 40*(2), 87-95. https://doi.org/10.1177/1076217517690190

Lee, K. M., & Slate, J. R. (2014). Differences in advanced achievement outcomes for Texas students as a function of economic disadvantage. *Journal of Education Research, 8*(3), 137-149.

Li, L. (2022). Reskilling and upskilling the future-ready workforce for Industry 4.0 and beyond. *Information Systems Frontier: A Journal of Research and Innovation,* 1-16. https://doi.org/10.1007/s10796-022-10308-y

McLaughlin, M., & Rank, M. R. (2018). Estimating the economic cost of childhood poverty in the United States. *Social Work Research, 42*(2), 73-83. https://doi.org/10.1093/swr/svy007

Peck, A. (2018). Mapping career-ready skills through student leadership programs. *New Directions for Student Leadership,* 157, 71-83. https://doi.org/10.1002/yd.20280

Tavassolie, T., & Winsler, A. (2019). Predictors of mandatory 3rd grade retention from high-stakes test performance for low-income, ethnically diverse children. *Early Childhood Research Quarterly*, *48*, 62-74. https://doi.org/10.1016/j.ecresq.2019.02.002

Texas Education Agency. (2019). *Economically disadvantaged status reports: Report criteria*. https://rptsvr1.tea.texas.gov/cgi/sas/broker?_service=marykay&_program=adhoc.std_download_selected_report.sas&rpt_subject=about&fname=abteco22&ftype=html

Texas Education Agency. (2022a). *2021-22 Texas Academic Performance Report (TAPR) glossary.* https://rptsvr1.tea.texas.gov/perfreport/tapr/2022/glossary.pdf

Texas Education Agency. (2022b). *2022 accountability manual*. https://tea.texas.gov/sites/default/files/2022-accountability-manual-full.pdf