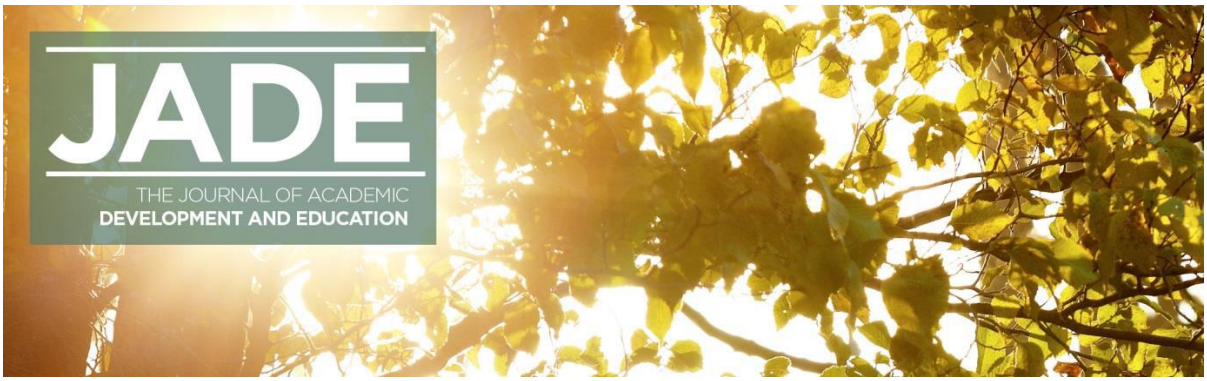

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Article:

The Impact of a Career and Technical Education on the Graduation Rates and College Enrollment of High School Students

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Short Title: Career and Technical Education and Its impact on Graduation Rates and College Enrollment

ABSTRACT

Context and Objectives. This study explored the impact **Career and Technical Education** (CTE) had on high school students in Tennessee. Specifically, the purpose of this quantitative study was to compare **graduation rates** and **college enrollment** rates between **CTE concentrators** and **non-concentrators**.
Methods. The researcher examined existing data from 39 schools in West Tennessee from the 2013-14 and 2014-15 years provided by districts CTE departments.
Results. Results indicated that CTE concentrators were more likely to graduate high school and enroll in postsecondary education than were non-concentrators.
Discussion and Conclusion. CTE can be a significant component of high school education and is connected to measurable success for students of all backgrounds. Schools should consider expanding opportunities for students to gain knowledge directly related to their career interests and strengths.

Keywords: College and Career Readiness, graduation rate, college enrollment

Introduction

The United States high school graduation rate was a record 84% in 2016, which was the highest percentage since states adopted a new uniform way of calculating graduation rates (National Center for Education Statistics [NCES], 2017). Seventy-six percent of black students graduated on time and 79% of Hispanic students graduated on time compared to 88% of white students and 91% of Asian/Pacific Islander students (Balingit 2017).

Although minority groups saw a rise in on-time graduation rates in 2016, gaps persist for low-income and minority students and students with disabilities. Semuels (2016)

argued that inequities between wealthier and poorer districts continue to exist in all states across the United States. Kearney and Levine (2016) found that one-quarter or more of boys who started high school in the higher inequality states of Louisiana, Mississippi, Georgia, and the District Columbia failed to graduate in a four-year period, compared to 10% percent in Vermont, Wisconsin, North Dakota, and Nebraska–lower inequality states. Moreover, Layton (2014) suggested that it is not unusual for major cities to experience a higher dropout rate and lower graduation rate than states.

Context and Objectives

This study was designed to examine the impact of Career and Technical Education (CTE) on CTE concentrators and non-concentrators. CTE refers to a program in which courses (both at the high school and the postsecondary sub-baccalaureate levels) focus on the skills and knowledge required for specific jobs or fields of work. The occupational fields may include: (a) agriculture and natural resources, (b) business support, management, and finance, (c) communications and design, (d) computer and information sciences, (e) construction, (f) consumer services, (g) education, (h) engineering, architecture, and science technologies, (i) health sciences, (j) manufacturing, (k) marketing, (l) public, legal, social, and protective services, (m) repair, (n) and transportation. At the high school level, CTE is sometimes expanded beyond "occupational education" to include family and consumer sciences education and courses that provide general labor market skills. Effective Career and Technical Education (CTE) programs allow students to earn dual enrollment credits, industry-endorsed certificates, and technical endorsements while earning high school diplomas (Plank, DeLuca, & Estacion, 2005). Although the United States high school graduation rate has increased in recent years, differences exist by race and ethnicity, socioeconomic status, immigration status and state (American Institutes for Research, 2016). The 2013 dropout rates for Asian and Caucasian 16- to 24-year-olds were lower than their African American and Hispanic students. Lynch (2016) noted since the National Center for Education Statistics started tracking different groups of high school students in the late 1960s, the socioeconomic status of each pupil has impacted the graduation rate. Students from low-income families are 2.4 times more likely to drop out than middle-income students, and more than 10 times more likely to drop out than their high-income peers.

Methods

A quantitative research method was used to gather existing data regarding graduation rates of CTE concentrators and non-concentrators. Concentrators were considered students who took three or more CTE courses, while non-concentrators were students who took less than three CTE courses. The following research questions guided the study.

1) Is there a significant difference between the graduation rates of Career and Technical Education concentrators and non-concentrator students?

2) Is there a relationship between college enrollment and the completion of a Career and Technical Education (CTE) program?

This study explored (a) whether CTE concentrators were more likely to graduate from high school than non-concentrators and (b) whether more CTE concentrators continued on to postsecondary education than their non-concentrators counterparts. Data from a total of 1470 students were included in the study, of which 479 (32.8%) were CTE concentrators and 991 (67.2%) were non-concentrators from the 2013-2014 school year. Additionally, in the 2014-2015 school year, a total of 1455 students were selected for this analysis. For the 2014-2015 sample, 641 (44.1%) were CTE concentrators and 815 (56.0%) were CTE non-concentrators. Graduation rates were determined by whether or not students obtained a high school diploma. College enrollment, was determined by whether or not students attended either a 2- or 4-year college after high school graduation. A number of one-way ANOVAs were utilized to analyze the data. The type of student (CTE concentrators or non-concentrator served as the independent variable while graduate rate and college enrollment served the dependent variables). The study was conducted after permission was granted to obtain existing, secondary data from high school CTE students. All analyses were conducted using SPSS.

Results

For students from the 2013-2014 school year, a one-way ANOVA determined that concentrators (Mean [M] = 1.071) were significantly more likely to graduate than non-concentrators (M = 1.139). Results indicated a significant difference in graduation rates between concentrators and non-concentrators [$F(1, 1{,}1468) = 14.694$, $p<.001$]. For students from the 2014-2015 school year, a one-way ANOVA also determined that CTE concentrators (M = 1.055) were significantly more likely to graduate than were CTE non-concentrators (M = 1.151). Results indicated a significant difference in graduation rates between concentrators and non-concentrators [$F(1, 1453) = 35.291$, $p < .001$.

[Insert Table 1 about here]

For students from the 2013-2014 school year, results indicated that CTE concentrators (M = 1.604) were significantly more likely to enroll in college than were non-concentrators (M = 1.993), [$F(1, 1492) = 598.694$, $p< .001$]. For students from the 2014-2015 school year, results indicated a significant difference between the groups [$F (1, 1464) = 378.109$, $p < .001$]. CTE concentrators (M = 1.663) were significantly more likely to enroll in college than CTE non-concentrators (M = 1.991).

[Insert Table 2 about here]

Discussion

Career and Technical Education (CTE) may be the strategy needed for graduating more students. It is believed that practical learning will keep student interest for those who may otherwise be turned off by academic-filled class schedules. Career and Technical

Education concentrators (students who have taken three or more CTE courses) are more likely to graduate from high school than their peers on average. CTE is eliminating vocational education that consisted of low-level courses, job training, and single electives and replacing it with academic rigor, integrated, and sequenced programs of study that align with and lead to postsecondary education (Brand, Valent, & Browning, 2013). Further, these programs provide students with opportunities such as critical thinking, collaboration, problem solving, innovation, teamwork, and communication education (Brand, Valent, & Browning, 2013). By providing non-duplicative progression of courses that align secondary education with postsecondary education to adequately prepare students to succeed in college, secondary students can participate in dual enrollment programs to acquire college credits; and lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree (Stipanovic, Lewis, & Stringfield, 2012). Petrilli, and Shaw (2016) suggested that CTE students were just as likely to pursue a four-year degree when compared to their non-CTE peers. CTE concentrators are more likely to graduate high school by 18% to 21%.

Loschert (2016) noted that students from low-income high schools, where at least 50% of students qualify for free or reduced-price lunch (FRPL) are less likely to enroll in postsecondary education, continue, and earn a degree than their more affluent peers. In fact, *The High School Benchmarks Report: National College Progression Rates*, an annual report from the National Student Clearinghouse® Research Center™ (NSCRC) stated that the school poverty level is one of the strongest predictors of whether students will continue their education after high school. Among the subgroup of low-income schools considered as “high-poverty” high schools, where at least three-quarters of students qualify for FRPL, 51% of graduates enrolled in college immediately after high school. Students from low-income public high schools also continue and complete college at lower rates than those from higher-income schools.

Effective CTE programs allow students to earn dual enrollment credits, industry-endorsed certificates, and technical endorsements while earning high school diplomas (Plank, DeLuca, & Estacion, 2005). Dual enrollment is a core component of many CTE programs, ensuring students can advance along a career pathway that concludes in a postsecondary degree or credential (ACTE, 2014). Moreover, an apprenticeship is a CTE program that allows students to transition from high school to college and from college to the workplace (Bradley, 2016). CTE career pathways, bridging grades 9 through 14 from high school to college (Visher, 2015) have the potential to engage more students and increase high school graduation rates and postsecondary success (College and Career Readiness and Success Center, 2013).

Historically, children within high poverty environments were often targeted for the then, vocational programs (Lewis & Cheng, 2006; Stone, 2014; Symonds, Schwartz, & Ferguson, 2011). Also, many low-performing students were placed in low-level vocational education courses that did not prepare them for success in postsecondary

education. CTE continues to be viewed by some as a low-level vocational education (College and Career Readiness and Success Center, 2013). Nevertheless, currently most Career and Technical Education programs are designed to hold all students to more rigorous standards to prepare them for postsecondary education and beyond.

Careers and technical education programs offer students an alternative to college prep programs. Although there have been discussions about career and technical education and academic "tracking," or the sorting of students into tiered courses based on past academic performance or perceived ability, CTE may offer another path for high school completion for non-college bound students. Depending on its structure, academic requirements, and student demographics, a career and technical program can resemble an academic track in that certain types of students or certain educational outcomes may predominate (Edglossary, 2014). However, schools may be hurting student motivation by encouraging all students to go to college. Not every student wants to go to college; resembling college students, high school students should be allowed to change their mind as to the educational or career path that interest them (Richmond, 2012).

Research shows disadvantaged students have greater success when enrolled in CTE programs. CTE can benefit students directly by allowing them to earn money, both before and after graduation, increasing student engagement, retention, and persistence and directing them to postsecondary education and the pursuit of lifelong learning (Brown, 2003). Many factors contribute to these outcomes. Career and technical education programs motivate students to get involved in their learning by engaging them in problem-solving activities that lead to the construction of knowledge and by providing them with hands-on activities that enable them to apply knowledge.

Over the past few decades, learning expectations for career and technical education have risen significantly, largely in response to the increasing sophistication of modern careers that are demanding higher levels of education, training, and skill from the workforce (Edglossary, 2014). To directly address the college- and career-readiness needs of all students, including disadvantaged or at-risk students, decrease the dropout rate, increase student engagement and address the nationwide skills gap, schools should consider expanding opportunities for students to gain knowledge directly related to their career interests and strengths. It is important to place more emphasis on the preparation of high school students for college and careers because both options will require some form of advanced education or skills training if students are to compete in today's labor market.

Bradley (2016) stated that South Carolina has created a pipeline for students to transition from high school to college and from college to the workplace through their Apprenticeship Carolina program. While adding value to the local economy, Apprenticeship Carolina is a program that does not have apprentices; it is an intermediary and an extension of the technical college system in South Carolina. Through this program, youth apprentices who are registered with the U.S. Department of Labor's Office of Apprenticeship, work, and earn a wage, have the option to dual

enroll in the South Carolina Technical College System (Bradley, 2016). Finally, Chambers (2017) suggested that most CTE high school programs offer early college credit opportunities to provide a seamless transition to post-secondary education.

Conclusion

The best career and technical education program is one that gives all students tools to shape the future. Consistence with other findings, this research found several benefits to high-quality CTE programs such as enabling students to earn dual enrollment credits, industry-endorsed certificates, and technical endorsements while earning high school diplomas (Plank, DeLuca, & Estacion, 2005). Additionally, Dougherty (2016) argues that CTE concentrators are 21% more likely to graduate than non-concentrators. Finally, more students have gone on to post-secondary education and attend postsecondary training and professional development associated with their careers (Fraser, 2013).

By the time students enter high school, many are already discouraged by academics and choose employment to make money. Over time, this eventually leads to dropouts. To directly address the college- and career-readiness needs of all students, including disadvantaged or at-risk students, decrease the dropout rate, increase student engagement and address the nationwide skills gap, schools should consider expanding opportunities for students to gain knowledge directly related to their career interests and strengths. CTE can be a significant component of high school education and is connected to measurable success for students of all backgrounds.

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The authors declare that they have no competing interests'.

Table 1

Oneway ANOVA Results for Graduation Rates by CTE Concentrators and Non-concentrators

	df	*n*	*M*	*F*	*p*
2013-2014					
CTE Concentrators Graduation Rate	1	479	1.071	14.694	.000
CTE Non-Concentrators Graduation Rate	1	991	1.139		
Total		1470	1.117		
2014-2015					
CTE Concentrators Graduation Rate	1	641	1.055	35.291	.000
CTE Non-Concentrators Graduation Rate	1	814	1.151		
Total		1455	1.109		

Table 2

Oneway ANOVA Results for College Enrollment by CTE Concentrators and Non-concentrators

	df	*n*	*M*	*F*	*p*
2013-2014					
CTE Concentrators Enrollment	1	490	1.604	598.694	.000
CTE Non-Concentrators Enrollment	1	1004	1.993		
Total		1494	1.865		
2014-2015					
CTE Concentrators Enrollment	1	644	1.663	378.109	.000
CTE Non-Concentrators Enrollment	1	822	1.991		
Total		1466	1.847		