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A Study of Hybrid CTE Programming vs. Traditional CTE Programming for Students with IEPs at Two Technical High Schools

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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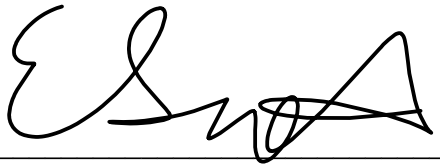
Signature:  Date: 07/29/2022

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Abstract

The purpose of this paper is to research the postsecondary readiness of students with IEPs at North and South Technical High schools within Special School District of St. Louis County (SSD). The attention is on the description of the readiness outcome of the students in a traditional career in the education program and technical education programs to the students with IEPs in hybrid technical programs. The paper also exploits the concept of inclusivity and diversity in learning and highlights the role of the CTEs in the preparation of the students for the future. However, success is described as either the student's enrollment to college or professional career.

First, the study distinguishes CTEs from vocation and tertiary learning training. The assessment disputes facility structure and student intellectual capacity factors to establish the real significance of the program (Bennett & Gallagher, 2013). It seeks clarity on the inclusivity enhanced by the program in the existing learning environment (Brown et al., 2019). In addition, it examines the multi-resource use in the program and the success rate in enrollment of the students with intellectual challenges and disabilities. The literature successfully addresses the hybrid component of the CTEs, identifying the rapid transformation in the program, revealing that skill orientation difference (Gordon & Schultz, 2020). However, a convectional learning program would adopt hybrid approaches. Therefore, the study explores the policy gaps that would help the program's administration.

The qualitative and quantitative data collection approach through designed questionnaires and analysis confirmed the study's findings. The study included the

types of CTE program, Participant feelings, opinions, experiences, and satisfaction levels. Therefore, the study demonstrates a significant difference in postsecondary outcomes for students with IEPs in hybrid CTE programming in comparison to students with IEPs in traditional CTE programming.

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Chapter One: Introduction

Background of the Study

The educational paradigm has undergone some immense transformation over the past few decades (Gottfried & Plasman, 2018). According to Gottfried and Plasman (2018), educational facilities across the globe are consistently engaging in strategies that are intended to attain the best outcomes. The American educational system is among the globe's leading, due to its sophistication. Different school districts have unique curricula, whose goal is to oversee not only the transition of learners from schools to the labor market but also encourage the development of focused learners who would emerge as job creators in the rapidly evolving and competitive world. The concept of inclusivity is also emerging as an instrumental factor in educational centers whereby learners from different socio-economic backgrounds share common classrooms and exploit their diversity. Brown et al. (2019) argued that culturally inclusive pedagogies are being adopted in the United States and other developed nations after the realization that the diversity of learners presents a unique learning opportunity for learners in urban schools. While past research has uncovered different trends within the educational sector, one astonishing and rather unique aspect of learning has been the Career and Technical Education (CTE) programs that make learners be employment-ready from their early years of high school education.

CTEs are learning programs that have been structured to prepare learners to leave high school ready for the challenges and opportunities that are available in the real world. According to Dougherty et al. (2018), the rationale for the development of CTE programs is to equip learners with the relevant skills that would allow them to fill the talent

shortage that is manifest in the current labor market with basic high school education. The implementation of CTE programs was driven by the increased numbers of learners who left high school facilities with zero skills that would allow them to secure employment. Theobald et al. (2019) explained that the existing curricula in over 50% of the learning institutions across the nation are inefficient in cultivating future leaders with the relevant competencies to move directly to the job market without pursuing tertiary educational services to enhance their skills. Furthermore, Theobald et al. (2019) argued that despite the increased number of CTE students who opt to pursue their careers after high school, 75% of this population are adopted into colleges and other higher learning institutions due to their excellent skillset.

Despite the content in multiple literary pieces that illustrate that CTE may have been a new vocabulary in the educational sector, the history of career and technical-based training has been in existence for over a century (Gordon & Schultz, 2020). The first instance of CTE in learning facilities was in 1917 after the signing into law of the Smith-Hughes National Vocational Education Act. The federal government aimed to invest in education programs that would make the youth and adolescents ready for the market. According to Gordon and Schultz (2020), there existed some gaps in the labor market, due to the inadequacy of people with the skills that would be relevant in the changing market. The consequence of such insufficiencies was the design of secondary vocational education that would fill the gaps in homemaking, industrial activities, and agriculture. Another instrumental milestone in CTE's history was the creation of the American Vocational Association. This association was instrumental in pushing for the allocation of funds to vocational training facilities that equipped high school students with the relevant

skills to thrive in the highly competitive market (Gordon & Schultz, 2020). Diversity in these institutions was accomplished in 1963 after the inclusion of a clause to the Vocational Education Act that allowed all individuals from the various American communities to attend these learning institutions. Other amendments were made in 1976 to include the female population that showed an overwhelming interest in technical careers (Lombardi et al., 2018). CTE was referred to as vocational training throughout its history. However, the term vocational was retired following the development of the 2006's Carl D. Perkins Career and Technical Education Act. CTE has received increased support during the proceeding years from the legislative and executive government branches

One important attribute of CTE that has not changed has been its focus on the individual skills and capabilities of the learners in various technical high schools. CTE is individualized, since educators are consistently designing learning products that are streamlined to the aspirations of learners (Andreason, 2016). The evidence-oriented nature of CTE prompts instructors to continuously explore avenues and strategies through which they can get the best outcomes from the growing learners' populations. Furthermore, CTE provides a pathway for ultimate career satisfaction, with the median wages of the graduates from such facilities being higher than those of an average college graduate (Powell, 2019). Consequently, CTE has been effective in closing the gap between career and education.

The Special School District of St. Louis County is an excellent case study that could be used to analyze the dynamics and efficacy of CTE in attaining better educational outcomes. The district's establishment was in 1957 to serve St. Louis County (Lohse &

Andert, 2019). A principal goal of the district is to prepare learners from the St. Louis County region with special education services and career and technical education training. The district includes two technical high schools: North and South Technical High Schools. Table 1 shows the student population's distribution in the two technical high schools and the number of technical programs offered.

Table 1

Student Population

	North Technical High School	South Technical High School
Sending Districts	8	14
Sophomores	208	-
Juniors	321	374
Seniors	268	332
# of Programs	25	26

The facilities offer full and half-day attendance options for the students who undertake up to 25 different courses at North Technical High School. South Technical High School, in contrast, has 14 sending districts, and only offers the half-day learning option for its population of students. A significant aspect of the school district is their belief in the capacities and scope of CTE that allow learners to grasp real-world skills, study in dynamic classrooms, and explore the available career options in the market (Lohse & Andert, 2019). With the highly trained instructors with full-time work experiences of at least two years in their technical field, SSD prides itself with the

offerings of both hybrid CTE programs and traditional CTE programs. The successful outcomes of the learners at both schools are evaluated based on their attendance, discipline, adherence to school policies, and academic attainments. Consequently, students have the capability to leave either school with the soft skills and technical skills that would increase their competitiveness in the labor markets.

Purpose of the Study

The study aims to evaluate students' postsecondary readiness with IEPs at two Technical High Schools (North Technical and South Technical High School, which are both parts of the Special School District of St. Louis County or SSD). Technical training allows learners to apply the information gathered throughout their educational journeys and endeavors to support the workforce (Chukwu et al., 2020). While some educational facilities use the traditional CTE programs, institutions such as North Technical and South Technical High Schools have incorporated a hybrid CTE programming that allows learners to harness their full potential and explore their skills exhaustively. The legal and policy-based barriers and enhancers for attaining educational goals by enrolling in CTE programs were evaluated. According to Schmalzried and Harvey (2014), the current legislations compel CTE institutions to include learners with various educational disabilities in the training program. The study investigates the extent to which the educational programs at the identified research sites conform to this legal requirement. Another purpose of the study is to examine CTE teacher-level staff perceptions regarding how learners with IEPs align to the postsecondary transitional goals in the two defined settings. Past studies by Theobald et al. (2019) and Lombardi et al. (2018) have established that students with educational disabilities and technical skills form the largest

number of the blue-collar workforce after technical training. The study also purposes to analyze the perceptions of parents regarding key indicators that demonstrate if their child with an IEP has attained postsecondary success in traditional CTE coursework vs. hybrid CTE coursework.

The necessity of parents in shaping the career paths of their children cannot be understated (Surr & Redding, 2017). Surr and Redding (2017) argued that parents are the central stakeholders in CTE facilities as they offer financial and moral support to their children who may have different educational disabilities. Therefore, their input and assumptions regarding the specific CTE type and their efficacy must be defined. Another crucial purpose of the study is to evaluate the competence of educators against their perceived capacities to transition learners in the hybrid and traditional CTE programs to their careers. Students' academic milestones are shaped by educators who utilize their experiences and skillsets to structure programs that would guarantee utmost success. Educators' roles are dynamic, given the transformation in the educational realm. Stone III (2017) stated that while the qualifications of teachers matter in vocational and other technical training facilities, the perceptions of this group of experts determine their ability to pass instructions to their learners appropriately. The study's final purpose is to evaluate the perceptions of graduates with an individualized educational plan regarding whether and how the soft skills that they gathered through their technical education has assisted them to become workforce or college ready, regardless of their technical educational program (hybrid or technical education).

Rationale and Significance of the Study

The rationale for conducting the study is the hypothesized variation in the success rates of learners undertaking both the hybrid and the traditional CTE programs within Special School District of St. Louis County (SSD). CTE programs are designed to enhance the reliability of students who would join the technical workforce by prompting the learners to develop positive attitudes and thought processes. Furthermore, CTE showcases the willingness of students to work, as well as their ability to translate the concepts that they study in classrooms to real-world environments. Therefore, one approach to evaluating learners' abilities to translate theory into practice is examining the environments in which they thrive. This study provides the platforms for comparing two environment types to define which one enhances the skills and competencies of CTE scholars.

SSD offers CTE in two variants, both of which have been effective in addressing the challenges faced by learners in their quest to transition from high school to post-secondary institutions or their careers. The study's rationale is to identify how outcomes change considering the perceptions of teachers, families, and the students taking these courses. Fluhr et al. (2017) argued that success in CTE is a psychological factor that rises whenever there exists a perfect fit between the perception of education stakeholders and the dreams of the scholars taking such courses. Negative perceptions reduce the morale of parents to offer the necessary support, educators to administer knowledge as required, and students to work towards their aspirations. Such influence of perceptions and attitudes towards the causes being taken have not been captured by previous pieces of literature on this concept.

Lastly, the COVID-19 pandemic substantially disrupted educational activities across the globe. Governments of various countries adopted laws and policies that were designed to mitigate the virus's spread that limited interaction among learners. Additionally, the anti-socialization policies encouraged the adoption of teaching models on online platforms (Drane et al., 2020). The rationale for conducting this study is to evaluate the virus' implication for learning activities within the technical schools where education is primarily hands-on. According to Haridy (2020), the relationship between education and young persons in large magnitudes can be described as precarious. Haridy (2020) established that there exists some possibility that many young persons may lose touch with education, since the curriculum has shifted from the traditional offline to online platforms. Furthermore, learner disengagement is a possibility (if not an eventuality), as the interaction aspect of education has substantially been limited by the restrictive measures that encourage social distancing.

The study is significant as it ventures into a field that has received limited scholarly and research attention in the past. While many studies explore the dynamics and significance of a hybrid educational program in enhancing student successes, very few studies have explored such programming in the light of CTEs. Garza Mitchell (2017) argued that the implementation of hybrid programs in technical facilities is a tedious and time-consuming endeavor that requires immense funding and the dedication of both learners and educational stakeholders. The study, alongside others, explored in Chapter Two, do not provide a comparative analysis of the hybrid and traditional programs from the students' outcome dimensions.

The study is also significant as it evaluates the influence of external factors on the development of soft skills among learners. According to Jacobson (2013), the current workforce severely lacks soft skills. Individuals who graduate from colleges and other post-secondary institutions as experts have not comprehended the art of communication that would guarantee organizational success. Jacobson (2013) further argued that the educational system failed to provide the relevant platform through which learners could boost their enthusiasm and attitude towards the changes and transitions in the current work environment. A major success of CTE has been its ability to prompt learners to develop positive attitudes towards what they do and the actions that they take to meet their future customers' satisfaction. Other soft skills transferred through technical training in specialized high schools include teamwork and networking. Unlike other conventional institutions that train learners to be significant members of the workforce and to remain competitive in the employment landscape, CTE encourages critical thinking and problem solving by narrowing the gap between reality and perceptions while encouraging the development of work ethic.

Research Questions

The study's overarching question is this: Which technical programming (hybrid CTE or traditional CTE) most effectively prepares high school students with an Individualized Education Plan (IEP) for post-secondary success?

The research questions are as follows:

RQ1: What are the perceptions of students with IEPs regarding their readiness for post-secondary outcomes in traditional CTE coursework vs. hybrid coursework?

RQ2: What are the perceptions of CTE teacher-level staff regarding the alignment of students with IEPs towards post-secondary transitional goals in traditional CTE coursework vs. hybrid CTE coursework?

RQ3: What are the perceptions of parents regarding key indicators that demonstrate their child with an IEP has post-secondary readiness in traditional CTE coursework vs. hybrid CTE coursework?

RQ4: What are the perceptions from the 180-day follow up studies regarding students with IEPs and their post-secondary readiness in traditional CTE coursework vs. hybrid CTE coursework?

RQ5: What are the insights of CTE teacher-level staff regarding their ability to prepare students with IEPs for post-secondary readiness in traditional CTE coursework vs. hybrid CTE coursework?

RQ6: What are the perceptions of students with IEPs regarding the soft skills training they received in their coursework to prepare them for post-secondary outcomes in traditional CTE coursework vs. hybrid coursework?

Hypotheses

The following are the null and alternative hypotheses for this study:

H_0: There will be no significant difference in post-secondary outcomes for students with IEPs in Hybrid CTE programming when compared to students with IEPs in traditional CTE programming.

H_1: There will be a significant difference in post-secondary outcomes for students with IEPs in Hybrid CTE programming when compared to students with IEPs in traditional CTE programming.

Methodology

A mixed methods design was used to evaluate and collect data for this study. By utilizing this design, the researcher was able to have various data points to assess numerical and characteristic information. A survey link was emailed out by SSD's Evaluation and Research Department to graduates with IEPs from both technical schools who graduated in 2018, 2019, and 2020.

Limitations

Various limitations exist in studies regardless of the researcher's approaches to guarantee the success of the research. The study had hypotheses and research questions that guided the entire data collection and analysis process. Additionally, the researcher's experience working in technical education allowed them to identify gaps in CTEs and design a study that could reflect the same. However, four primary limitations were eminent in the study.

The first limitation was the potential bias that arose from the sampling model that was adopted. Pietrantuono and Russo (2018) argued that non-probabilistic sampling models provide researchers with the power to determine the nature and features of the participants who are most suited to the study. Bias may cloud the researcher's judgment, thereby hindering their capacity to gather reliable findings. The study strived to eliminate the bias by cross-referencing the obtained findings with a body of literature in the form of secondary research.

The second limitation was the inability to gather objective data given the type of research design used. The study focused on the judgments and assertions of the participants. While some respondents potentially provided honest answers, some

responses may have reflected the participants' desires, rather than the reality that exists. Therefore, one primary approach used to eliminate such a limitation was the recruitment of a large sample and analysis of the commonalities in their responses' patterns.

Third, the use of two schools may have been insufficient in reflecting the variations in the scholarly outcomes and dynamics of both the traditional and the hybrid CTE programming models. Technical education has emerged as a prevalent model of transitioning high school students to their careers without the necessity of joining post-secondary learning institutions. However, the protocols and approaches used by the SSD may vary sharply from those used by other school districts. Therefore, this limitation was eliminated by using a mixed method data collection, comprised of quantitative and qualitative data from varied demographics of graduates, parents, and teacher-level staff.

The final limitation of the study was its cumbersome data analysis processes that consumed the time that would have been spent on other aspects of the research. The quantitative approach of research was utilized with a 180-day follow-up being conducted to confirm the findings that were obtained. The limitation was successfully mitigated by working with the SSD's Evaluation and Research department to acquire the appropriate data needed to send out the survey to graduates with IEPs.

Definition of Terms

Below are the key terms that are utilized in the research.

180-day follow up: A report completed by high school counselors in the United States to collect information related to what May graduates are doing 180 days, or six months, after graduation. There are standard categories that each counselor will mark such as "Employed," "2-year college/university," or "Unknown Follow-Up Status." The

information collected is shared with each state's Department of Elementary and Secondary Education agency.

Case manager: A case manager is a point of contact for a student's individualized education plan or IEP. A case manager ensures services in the IEP are being followed and that the student's IEP is held annually. The case manager is a point of contact for the student, parents, teachers, counselors, and administrators in relationship to a student's progress in P-12 education.

Individualized Education Plan (IEP): A legal document created in P-12 educational institutions for students ages 3 through 21 that maps out instructional supports to help them make progress and thrive in their educational life and personal life.

Hybrid Career and Technical Education (CTE): For the purpose of this study, hybrid career and technical education refers to career-education based programs designed to accommodate a diverse group of learners. Instruction is differentiated to emphasize the strengths of each student and is ideal for students seeking to explore specific career pathways in a smaller setting with additional supports that facilitate learning. The class sizes are smaller, and the pace offers much more flexibility to account for the variety in student learning styles. These programs can segue into multiple career and post-secondary pathways.

Traditional Career and Technical Education (CTE): The practice of teaching specific career skills to students in middle school, high school, and post-secondary institutions. This education is divided into 16 career clusters and can segue into multiple career and post-secondary pathways (Stauffer, 2021).

Post-Secondary readiness: A high school students' aptitude and preparation for entering the world of work or college/university.

Post-secondary outcomes: For the purpose of this study, this has reference to a graduating high school student entering the world of work or entering college/university.

Soft skills training: For the purpose of this study, soft skills training is a combination of people skills, social skills, communication skills, character traits, attitudes, career attributes, social intelligence and emotional intelligence that enable people to navigate their environment, work well with others, perform well, and achieve their goals.

Transition plan: IDEA (Individuals with Disabilities Education Act 2004) requires that each student with an IEP, beginning at the age of 16, have a plan created an annually evaluated by a student's IEP team. A transition plan is a systematic, individualized process that incorporates a coordinated set of activities. It is a continuous process throughout middle school and high school. A significant aspect of the law's requirements relates to including transition-related goals and statements in the IEPs of students preparing for life after high school. A transition plan helps students and families think about the future, jointly plan the middle/high school experiences, help students and families make service and adult agency connections, and increase chances of positive post-secondary outcomes (Indiana Secondary Transition Resource Center, 2018 p. 2).

Summary

In summary, while past research has uncovered different trends within the educational sector, one astonishing and rather unique aspect of learning has been the CTE programs that make learners be employment-ready from their early years of high school

education. The study aims to evaluate the postsecondary readiness of students with IEPs at two technical high schools (North Technical and South Technical High School, which are both part of the Special School District of St. Louis County or SSD). The research is significant as it lays the groundwork for evaluation of the most effective type of CTE programs in enhancing the preparedness of learners in various tertiary institutions. The next chapters evaluate the research concept from a literary dimension by comparing the thoughts and findings of past studies, describe the methodological approaches used in this study, and present and describe the obtained findings, with recommendations for the future.

Chapter Two: Review of Literature

Introduction

The literature review provides a summary, critical review, and evaluation of previous studies on the theme of traditional versus hybrid CTE for students with an IEP. For a study to be included, it should have been peer-reviewed and published in an international journal of repute. However, early seminal works were also included to contextualize various theoretical developments. Opinion articles and editorials were not included in the study. Thus, the insights generated from the literature review will help establish which is more successful between hybrid CTE and traditional CTE programs in producing greater outcomes. While there was little research on hybrid CTE programming and its benefits, the current scholarship on the study topic and question deemed CTE more effective for all students as it prepares them for life after high school.

Single Sex and Single Sex Classroom

While various countries moved from coeducation in the latter parts of the 20th century in public school system, various countries have continued to have sizeable populations of single sex schools. For Smyth (2020), various countries, including Australia, New Zealand, and Ireland continue to have a sizeable population of single sex-school systems. In Britain and the United States, there has been a concerted effort to promote single sex school system. However, Howard (2013), taking a case analysis of the United States, believes that the continued development of single sex educational paradigms is as a result of the perceived underachievement by boys or the persistence of gendered patterns of subject take-up. Only few studies have considered the justification proffered for the development of single sex education. In early studies conducted by

Connel (1996), various key issues arise when comparing the two types of settings. One of the most discussed themes between the two types of settings related to dominance — the dominating presence of boys in the classroom. Studies indicate that boys contribute massively to classroom interaction (for instance, by calling out answers), or dominate in hands-on activities such as laboratory work and computer sessions (Askew & Ross 1988; Francis, 2004; Howe 1997).

The history of single sex-education is largely transparent in the 21st century. In the 1960s, there was a mandated shift to coeducation in various western countries. The idea was that coeducation was less expensive as a modality for schooling the baby-boomers — and thrusting toward gender quality. In 1972, a law was implemented that made it obligatory for co-education in the U.S. public school system. Later in the 1990s through 2000s, there were studies that supported single-sex education — majority of such studies indicated that children in single sex educational structures outperformed those in coeducational schools (Fize, 2003; Riodan, 1990; Spiegel 1998). However, earlier in the new millennium, the implementation of U.S. Law of 2002, revoked the use of obligatory coeducation in the public schooling and system — three million dollars were used to support the single-sex school option. However, the use of single sex in education continues to receive a bipartisan support.

Other studies (Francis, 2000; Warrington & Younger, 2000) have further demonstrated that boys tend to be highly disruptive in the classroom, and resultingly, experience higher negative interaction with teachers as a result of the misbehavior. Pollard (1999) indicated that not so long ago, coeducational single sex classes were considered to be the most appropriate educative aspect of K-12 learning. In the late 1960s

and 1970s, girls and boys could be routinely separated for classes on a daily basis. However, the bases of single sex class varied tremendously amongst its proponents. In some instances, such students were put in separate classes with unique but purportedly parallel subject matters. For instance, Pollard (1999) indicated that in America, boys would go to agricultural classes and girls to home economic classes. Looking at the situation using cultural nuances, the social makeup of the society in the 1960s played a crucial role in underpinning educational policy and developments. For Gurian et al. (2009), the assumption underlying such forms of classification was that they were necessary to prepare girls and boys for the disparate roles that they would later assume in their adult life.

In some instances, boys and girls were sent to disparate classes even though the curriculum and the subject matter were similar. For instance, some of the subjects that experienced this form of education included physical education and sex education. One of the assumptions for such types of single-sex classes was that boys and girls were separated due to assumptions about physical abilities and characteristics, social and personal functioning, and beliefs that were held by the adults concerning appropriate interaction between and among the sexes. However, Bigler and Signorella (2011) invoked the social structure of Victorian society and indicated that some single classes were established exclusively for excluding girls from some occupations that the society deemed were not appropriate for them.

However, in the contemporary social make-up, single sex classes have become less prevalent and continue to be phased out, especially for K-12 mixed school systems. The implementation of various laws, such as Tile IX prevented sex discrimination in

education and changed perception regarding men's and women's roles—emphasizing the need for experiencing similar educational experiences for both males and females. Mael (1998) argued that equality of access can be achieved best through the adoption of coeducational classes. In the contemporary society, there has been a renewed interest in the adoption of single sex classrooms. The interest has gained impetus from various schools of thought, including the desire for enhancing the academic achievement of girls in some forms of subjects, improving the social organization of the classroom, and providing structures for formal and informal socialization within some cultural contexts — especially within the African cultural context.

Gender and Sex in Schools

The controversial issue of gender differences in adolescent identity formation has attracted much theoretical and empirical attention, since Erickson introduced the concept in his controversial writings in the 1960s (Erikson, 1968). In his earlier postulations, Erikson proposed gender differences in adolescent resolutions to the fifth psychosocial task of 'identity vs. role confusion' in his life-cycle epigenetic scheme. More precisely, Erickson (1968, p. 283) indicated that a woman's identity could not be ultimately resolved until she was able to cultivate her procreative and other endowments. The controversial debates of Erikson on women's identity and the role of biology a relationship in the definition of self has permeated psychoanalytic, ego psychoanalytic, self-psychology, and psychology literatures over the years. However, in the contemporary world, the concept of sex has continued to be controversial, especially when various countries are continuing to recognize the rights of LGBTQ groups. This

controversy has permeated the school system and now brings many complex issues to the single-sex school system.

Studies indicate increased victimization of students who do not conform to binary sexual orientation (Cohen-Kettenis et al., 2003; Ketenes 1994). While the implications of gender are less understood in the education system, Drury et al. (2012) indicated that children who fail to conform to group gender expectations are often at higher risk of victimization than their peers. The concern about typicality has often been expressed in other studies (Cohen-Kettenis et al. 2003) and is a concern among various clinical psychologists that indicate that children deemed to warrant gender disorder diagnosis often have an increased risk of social rejection and psychological disorders. With the concerns about gender formation and identity, single-sex schools remain less visible in contemporary American society.

Rationale for Single-Sex Education and African American Education

The idea of cultural socialization as an impetus for single sex classrooms can be looked further. Using the African American as a construct, Davis (2003) indicated that the impetus was largely driven by the need to implement culturally centered educational models — with the single sex classes focusing mainly on the formal and informal socialization of girls and boys. The African-centered educational models were largely proposed for public school systems. One of the arguments for this construct was that schools situated closely to African American societies needed to be closely linked with the cultural expectations of the community — building upon and reinforming the community's cultural activity. The orientation towards this construct is that schools should not be solely oriented to the academic focus, but also be involved in the social and

personal development of their students and the likely roles that they would assume later in the society. Caldas and Bankston (1997) also supported the assertion that education should not only be for the individual development, but also support community development.

The academic underperformance of African American students is an issue of concern in the American public school system. For instance, Few (2004) indicated that by the time African American male students reach high school, 42% have failed at least one grade level. Dwarter (2014) documented that African-American male students have been overrepresented in the special education and remedial courses, grossly missing in gifted and talented programs, and disciplined at disproportionately high rates. Consequently, many of the African American male students attending urban and public schools continue to be represented at the bottom rung of virtually all the dictates of student's achievement. Due these concerns, a report by Schott Foundation (2008) indicated that the African-American students in the public-school systems are the most at risk of any student population.

Earlier works have indicated that the dismal academic performance of African American students is an epidemic that limits career progression and achievement for millions of African American students (Kunjufu, 2002; Porter, 1998). Based on national student achievement estimates, less than 50% of the African American male students graduate from high school, and less than 8% earn college degrees (Kaiser Family Foundation, 2006; Schott Foundation, 2008). While the other authors simply provide the statistics, Lips (2008) understood the social reasons for the low number of African American male students in the educational system—indicating that the low number is

associated with other factors including high rates of incarceration, poor health, and limited quality of health. A study commissioned by the Kaiser Foundation (2006) underscored the findings of Lips (2008), indicating that in 2005, more than 10% of African male students within the age category of 18 through 29 was incarcerated. The rate of unemployment among the population was alarmingly high. These statistics are a testament to Kunjufu's (2002) assertion that the American educational system has failed to meet the academic needs of African American male students.

The use of single sex education is a construct that can meet the complex needs of the African American students. Porter (1998) believed that the use of single sex education accounts for the very distinct and complex needs of the African American male students. Such a program was implemented in various states, and achieved considerable impact in Baltimore, Detroit, Houston Los Angeles, Philadelphia, Washington DC among other states. However, there remains a significant difference with the overall achievement of male students as compared to female students even with the adoption single-sex settings. For instance, Dwarte (2014) realized that single sex classrooms majorly favored the achievement of female students from the African American communities, as opposed to males. However, these findings are not surprising given that recent statistics have indicated an overall high performance of female students, as compared to male students (Coley, 2001). For instance, early studies conducted by Coley (2001) indicated that female students outperformed male students in various measures of achievement, such as standardized test performance, high school graduation rates and enrollment rates. Other studies indicate that there is value in the academic achievement through single-sex educational framework, and that supporting could be crucial for the academic

achievement of Latino and African American students (Panell, 2013). However, studies on the academic achievement of African American students instructed by African American male teacher based on the model are lacking.

CTE and Policy, Research, and Educational Practice

The U.S. government has implemented various policies towards CTE. According to Jacobson (2020), some of the CTE issues considered when developing the policies involve funding, industry-recognized credentials, work-based learning, and equal access to opportunities for students with an IEP. The numerous CTE policies enacted in the past few years reflects the country's changing attitudes to teaching as most people now advocate teaching specific career skills to students in middle school, high school, and post-secondary institutions. Illinois, Vermont, and Virginia were among the first 30 states to pass policies and legislation aimed at connecting students to businesses through apprenticeships among other CTE models. Jacobson (2020) argued that the Strengthening Career and Technical Education Act will provide over $1 billion annually for CTE programs across the country. The new law comes at a time when states and districts are seeking for new ways to expand their career pathway programs to better prepare the students with an IEP for college and work. Jacobson (2020) added that the new polices and laws are meant to reinforce how CTE programs offer students with career skills, as well as industry-recognized credentials.

According to the Association for Career and Technical Education's (ACTE) executive director, LeAnn Wilson, the over 200 CTE policies passed in almost all states, evidence of the significance of CTEs to learners in today's 21st century economy (Jacobson, 2020). For example, the state of Louisiana is now looking for new ways to

restructure its existing model to address underlying issues, such as stigma regarding CTE programs. The move would be effective since only 20% of students in the state graduate with a career diploma. Thus, governance related to CTE programs is one of the primary areas where states need to take direct action for better post-secondary outcome for the students with IEPs.

Previous evidence suggests that traditional and hybrid CTEs are useful for students with IEPs (Castellano et al., 2012; Wagner et al., 2016; Yell et al., 1998). For instance, Yell et al. (1998) noted that from a legal perspective, all students with an IEP are entitled to enroll in the CTE program of their choice regardless of their disability. The system allows the inclusion of all students depending on their specific needs. Teachers are expected establish the inherent needs of their students and develop strategies aimed at meeting them effectively (Bond, 2012). The method involves conducting physical meetings in which instructions are issued face-to-face, but sometimes they may be delivered through online correspondence. Using the two approaches ensures that the student's needs are understood and met, after which follow-ups are done (Bond, 2012). In most cases, the success of the CTE approach used is measured by how well a student transition from school to work (Phelps & Hanley-Maxwell, 1997). The current policies on CTE learning legally require all students to undergo a transition plan. Yell et al. (1998) recounted the legal history of IEP learning. The authors noted young people living with disabilities have historically been treated differently across the education system. However, the ratification of obligatory attendance laws in the early 20th century played an essential role in increasing the educational opportunities available for students with IEPs. For example, opportunities for admittance to public schools more than doubled

although not as many students as the government had targeted to benefit from an all-inclusive and effective education system (Yell et al., 1998). However, in the early 1970s, parents, and advocates for students with IEPs began utilizing legal means to push the government towards providing equal learning opportunities for all students including those with disabilities. These efforts played an essential role in ensuring success as they eventually resulted in the ratification of federal legislation and policies into laws that aimed at ensuring these rights. Today, these efforts continue to have far-reaching implications for policy, research, and educational practice in traditional or hybrid CTE for IEP post-secondary students.

One of the problems undermining the traditional and hybrid CTEs is the widespread supposition that educators are adequately trained to deliver them (Benavot, 1983). On the ground, there exists a significant gap as CTE educators are not well-equipped to secure the skills necessary to track vocational teaching programs (Benavot, 1983). The problem is reinforced by the fact that the majority of CTE teachers are overwhelmed by the needs of students with IEPs. As a result, they feel inadequate when trying to cater to these needs. Andreason (2016) noted that CTE teachers find themselves in work environments that require them to integrate a hands-on approach in their delivery knowledge. However, compared to hybrid approaches to CTE, the traditional one does not focus on the basic knowledge of pedagogical theory (Kerna, 2012). As such, CTE institutions should focus on providing the initial and ongoing training opportunities offered by traditional CTE programs while leveraging the innovations associated with the hybrid approach. However, Kerna (2012) noted it would be inherently difficult for schools to identify the type of training that is most appropriate for their students with

IEPs because only a few studies have been conducted to determine the inherent teacher in-service needs in CTE. Consequently, one of the significant challenges in CTE programs involves finding the right training program that fits the specific needs of CTE instructors and their class Kerna (2012). However, this need must be met since the CTE can have far-reaching implications on future policies and educational outcomes.

Across the United States, IEP post-secondary students are more likely to drop out of school as compared to the regular ones with no disabilities (Thurlow & Johnson, 2011). Additionally, IEP learners who end up dropping out of school are more likely to experience poorer adult outcomes, such as higher unemployment rates among others (Benavot, 1983; Wagner et al., 2005). Compared to the traditional CTE, the hybrid one is designed to offer learners an all-inclusive education with positive implications for their future and that of their societies (Benavot, 1983). While both models of CTE delivery in IEP post-secondary differ considerably, the growing efforts by the National Governors Association, coupled with the growing focus by the federal movement on IEP learners and their career readiness further propel institutional changes within the education system. These changes are essential in shaping the educational context necessary to maximize the potential benefits for such learners. Benavot's (1983) findings highlight the consequences of the policy, research, and educational practice. First, the traditional CTE may not necessarily provide the same benefits to students across all settings. In addition, each school should adopt the model that is tailor-designed to address their specific needs.

Lohse and Andert (2019) introduced the idea of hybrid CTE programming for students with IEPs. Lohse and Andert (2019) highlighted the implications for policy, research, and educational practice with regards to hybrid and traditional CTE programs.

Both CTE approaches provide meaningful opportunities and ramifications beyond the classroom. The hybrid methods utilized by today's CTE educators focus on mitigating the current challenges of distance, time, and cost experienced by learners with disabilities (Lohse & Andert, 2019). Both CTE approaches have a history of supporting students with IEPs. The current evidence gathered from the literature reviewed indicates that students with an IEP along with postsecondary outcomes significantly improved after being enrolled in vocational education (Brunner et al., 2019; Lohse & Andert, 2019). Furthermore, students with IEPs who receive vocational education usually report earning higher wages and enjoy higher rates of employment than their counterparts who do not receive similar training (Brunner et al, 2019).

Phelps and Hanley-Maxwell's (1997) work examined school-to-work transitions for students with IEPs. The duo acknowledges that school and employment-related outcomes for students with IEPs continue to be problematic when compared with those for non-disabled students. As such, future policies must ensure that educational practices are aligned with higher-quality outcomes for students with an IEP — sentiments further shared by other researchers (Bruner et al., 2019). Phelps and Hanley-Maxwell (1997) called for the improvement of future policies and CTE programs by advancing the knowledge base in supervised school and work experiences. This helps in reinforcing the current CTE curricula to be more functionally oriented by helping students with IEPs develop occupationally specific, academic, and employability that is systematically connected.

Garrison and Vaughan (2008) argued that the context of secondary education is currently experiencing significant changes. As such, social and technical, as well as

intellectual forces are now converging together, thereby pushing traditional CTE programs away and embracing the hybrid approach to CTE. The inherent forces have raised serious concerns with regards to the quality of the learning experience in secondary education. As such, leveraging hybrid web-based communications systems and technology can reinforce the transformation process of teaching and learning in secondary education (Lin, 2008). For the traditional CTE programs, the breakthrough may come when online learning is no longer separated from the regular classroom. Lin (2008) argued that future policies must approach such classrooms as a valued and integral component to traditional courses to provide quality learning experiences. Thus, the success of future policies and curricula is dependent on how well the current traditional systems are fundamentally redesigned, based on the hybrid approach. The overall concept of hybrid learning combines online and FTF instructions while optimizing the achievement of the learning objectives set for students with IEPs. Also, the hybrid approach applies the correct learning technologies that match the CTE learning needs of students with disabilities.

One of the primary limitations with the current literature reviewed is that it is relatively small-scale compared and more comprehensive studies are necessary. Additionally, the implications of the vibrant nature of personalized classes compared to the traditional ones are under studied. Thus, future studies need to leverage a more large-scale experimental design when examining factors impacting students with IEP's views in hybrid courses. Finally, the impending studies must compare and contrast traditional and hybrid CTEs to ascertain which of them is the best in improving the outcomes for

IEP student's post-secondary achievement. Doing so ensures the future policies and practices in CTE programs utilize an in-depth exploration of these factors.

The Progress of Education Reforms in Career and Technical Education (CTE)

In recent years, CTE reforms became the top of the policy agenda among stakeholders in the education sector. The improvements and amendments made on traditional CTE programs further fuel the debate on whether hybrid CTE is better than the traditional approach for post-secondary students with IEPs. Kantor (1986) explored vocational reform by examining their ideological origins in the early 20th century. Kantor's work is crucial in this study as it postulates that the reforms in CTE only differ from each other based on their structure. For example, the reforms targeted at hybrid CTEs are inherently different from the ones targeted at the traditional ones. Kantor (1986) noted that the current hybrid system is a result of countless reforms that better address inequality issues while emphasizing the need for increased socialization and training. As a result, the most effective reforms are the ones that advocate for adequate preparation as a primary function in the American education system. Consistently, Lombardi et al. (2018) further indicated that many of the hybrid systems currently in place have mostly underscored the need for equality in educational approaches and not individual achievement.

According to Kantor (1986), CTE programs became common in political and economic interests at the turn of the 20th century. This was a turning point in the field of vocational training because not only were corporate apologists, businessmen, and efficiency-oriented educators willing to support CTE programs, but also liberal reformers, labor leaders, and radical intellectuals that advocated for the vocationalization

of American schools. While these groups differed with each other with regards to the organization and objectives of vocational programs, they agreed to prioritize it into the future. Kantor (1986) argued that the National Association of Manufacturers (NAM) was the earliest and most vocal of all the advocates of CTE education. It was formed in 1895 and was focused on identifying ways in which graduate students could be integrated into the growing manufacturing sector as the country sought for international expansion. One of the implications for the reforms is that the students with IEP are now perceived as being instrumental in reinforcing the labor market within the manufacturing sector.

Castellano et al. (2003) explored CTE's reforms and their implications for future research and practice. The authors noted that it was not until the 1990s that the federal legislation authorized funding for secondary CTE education. Several reforms were also recommended and later implemented, such as increasing equality among students with IEPs. The reforms necessitated schools to integrate CTE into their broader school curricula which have since improved IEP student learning outcomes. Castellano et al. (2003) article focused on reviewing previous studies on the effects of CTE reforms in general. Also, the article examines how CTE can be melded with comprehensive secondary school reforms. Castellano et al. (2003) found that there were fewer studies about CTE intersection with comprehensive school reform. As such, the debate between which CTE is better between the traditional and the hybrid one may range on until sufficient scientific data is gathered. However, according to Kantor (1986), CTE reforms played a crucial role in ensuring vocational education helps American businesses actively competing in international markets. The traditional CTE approach focused on ensuring training was specialized to the needs of industrialization in America. On the contrary, the

hybrid approach ensures training is specialized to the needs of the modernized and highly connected global markets. Kantor (1986) acknowledged that the reforms in vocational education were long due, because before them students would drop out of school rapidly because of the inherent need for the young working-class to provide for their families. Kantor was one of the vocational reformers advocating for CTE programs to be implemented into schools to allow students to graduate with a skill.

Disabled students, immigrant youth, and the working-class are more likely to view going to school as being economically irrelevant (Garcia & Weiss, 2017). Also, they are less likely to compete for the skilled jobs in the labor market, due to the lack of individualized training they need to compete at such a level (Kantor, 1986). However, the author argued that by concentrating on curricular reforms at the cost of policies aimed at altering the normal processes within the labor market, vocational reformers disregarded the evidence suggesting that the need to make money led to higher dropout rates, since more jobs that working-class youth qualified for did not need extensive skill training. However, the drive to vocationalize schools intensified after subsequent studies started highlighting the implications of poverty, low wages, and the enervating work as a major problem both economically and socially. For instance, Fergusson et al. (2007) in his measure of school readiness indicated that poverty affects the educational attainment of children.

Kantor (1986) noted that the calls for educational reforms achieved their primary objective in 1917 after Congress passed the Smith-Hughes Act, which then mandated federal aid to be dispensed in trade and industrial subjects, and home economics. Moore (2017) recounted the progress of education reforms in career and technical education

after the Act was enacted. Some of the results experienced due to the reforms include having millions of Americans gaining knowledge in specific vocational fields. According to Moore (2017), students were now able to pursue advanced degrees and learned the skills necessary for gainful employment. Others have gone on to start their businesses, which is an important undertaking that increases people's living standards and reduces unemployment in the country.

Castellano et al. (2002) conducted a review of recent studies on current reforms to establish the impact of CTE improvements and identified the following essential features of an effective reform strategy: technical preparation; work-related experience; curriculum integration; and developing career pathways. The authors' work critically analyzed each strategy's processes and outcomes. Their primary supports were acknowledged. The strategy employed must, at its very core, support the reform through educational structures leveraging communities that focus on career clusters; vertical integration; and block scheduling. Secondly, they ought to reinforce the capacity for improvement through interdisciplinary teacher teams, and work-based learning opportunities (Castellano et al., 2002). Finally, an effective strategy is one that supports pedagogical reforms through academic standards and student learning policies aimed at meeting these standards. However, Jacobson (2013) viewed hybrid CTE as a form of Personal Development Education (PDE), which includes interpersonal and interaction skills that are required for students to function and succeed in today's highly connected and global-oriented world. Jacobson (2013) leveraged emergent research, which indicates that the majority of students must be well-equipped to handle both college and career, and hybrid CTE is essential in both settings.

Compared to traditional CTEs, the hybrid one is a result of numerous reforms, making it particularly critical for IEP learners who need personalized learning (Jacobson, 2013; Jordan et al., 2002). In his study, Jacobson (2013) focused on students' perceptions with regards to how hybrid CTE/PDE influenced their ability to communicate more effectively and work collaboratively with a range of peers. The study helped re-construct a deeper understanding of the role of PDE. The research results suggested that students now see themselves as more credible and capable of moving between their home, communities, and the larger world. Also, the study findings showed that communication remains one of the most essential gateway skills for students with IEPs in the 21st century. However, other studies indicate that CTE programs are in a midst of an historic shift and reform. Today, testing, teacher evaluation, and accountability, which are synonymous with the traditional CTE have fallen are out of favor (Theobald et al., 2019). On the contrary, early social and emotional learning, and personalized education are now being prioritized more than before. One inevitable question is whether a given CTE is a fad or something more substantial. However, Kazis (2005) believed that the hybrid CTE is particularly beneficial, as it addresses most of the persistent frustrations experienced by students with IEPs by making high school more relevant and effective in addressing their learning needs. Also, unlike traditional CTE, the hybrid one offers students with IEPs new paths, other than college to further advance their careers. Unlike traditional CTEs, hybrid ones are based on reforms and emerging trends, thus, they tend to rectify most of the challenges that have long plagued vocational education among students with IEPs (Theobald et al., 2019).

Hess and Martin (2019) appraised traditional CTEs in the past two decades and compared their results to some of the popular 21st-century education reforms. The report argued that since 1998, the overall number of studies examining CTE has doubled, as well as the media mentions. As such, the overall interest in CTE programs has been heightened across all stakeholders within the educational system. These are some of the key trends that have formed part of a larger drift into skill-based training and away from the theory-oriented learning in regular classrooms. For instance, media mentions of workforce development increased by 13% in the past two decades (Hess & Martin, 2019). The authors, however, noted that hybrid CTEs have been unusually long-running compared to the traditional ones.

Figure 1 illustrates the growing interest in CTE over the past years. It shows that the total number of U.S. media mentions since 1998 has significantly grown for both traditional and hybrid CTEs. Also, the growth is seen as part of a larger trend in the media attention to skills training and workforce preparedness (Figure 2; Hess & Martin, 2019). Indeed, media mentions of hybrid CTE dwarf those of traditional CTE and have grown faster. Thirdly, attention to CTE education has grown much more steadily than the attention made to major 21st-century reforms. Figure 3 shows that CTE may not have approached the intense attention given to the No Child Left Behind and Common Core reforms while at their peaks but CTE's public profile has always featured a marked and uninterrupted build over an extended period. Finally, the overall interest in CTE programs outpaces that in other prominent school improvement strategies. For example, between 1998 and 2008, the media mentions of school vouchers dwarfed those of CTE. However, over the past decade, this trend has changed despite vouchers being more

controversial, thus, more newsworthy. The current trend evidences the growing prominence of hybrid CTE, which has occurred in the past decade compared to traditional CTE, which was more prominent two decades ago. Therefore, the progress of education reforms in traditional CTE programs gives hybrid CTEs more staying power than other contested, high-profile 21st-century reforms. Consequently, hybrid CTE appears more poised to be a focal point for students with IEP's post-secondary outcomes.

Figure 1

The scope and sustained nature of the growth of U.S media articles' interest in CTE (Hess & Martin, 2019).

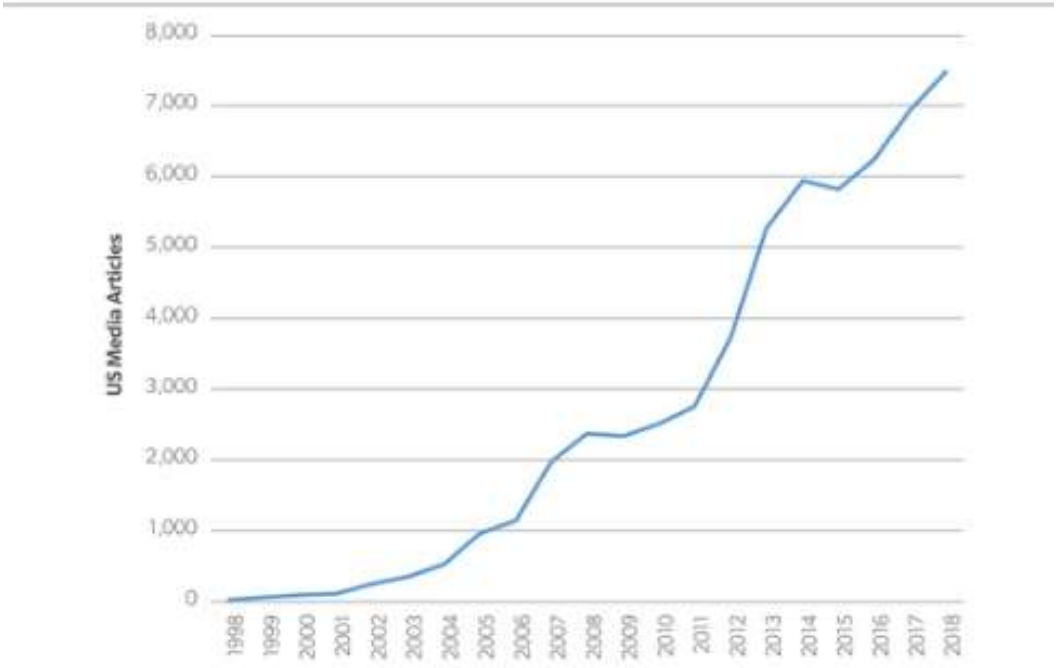


Figure 2

The heightened interest in CTE education is part of a larger trend (Hess & Martin, 2019).

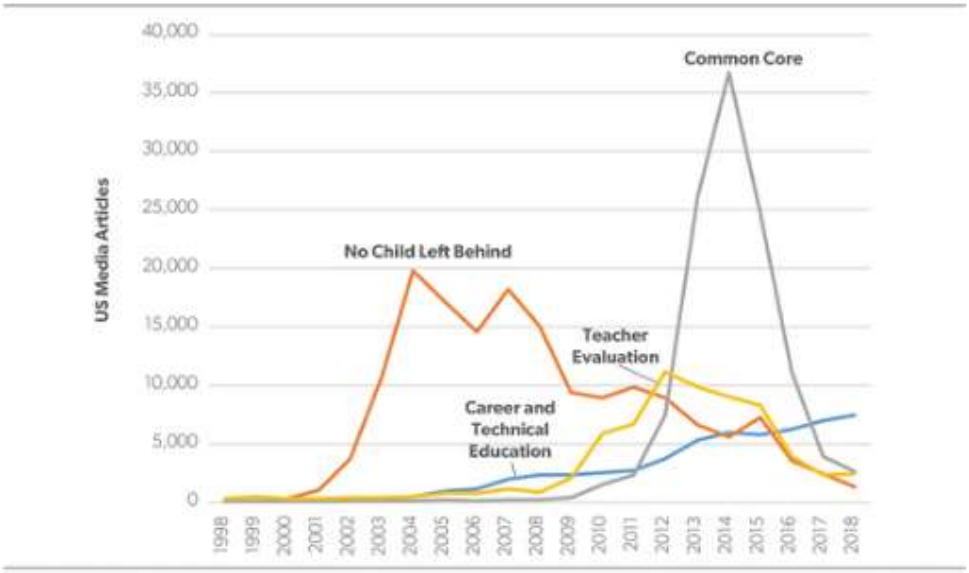
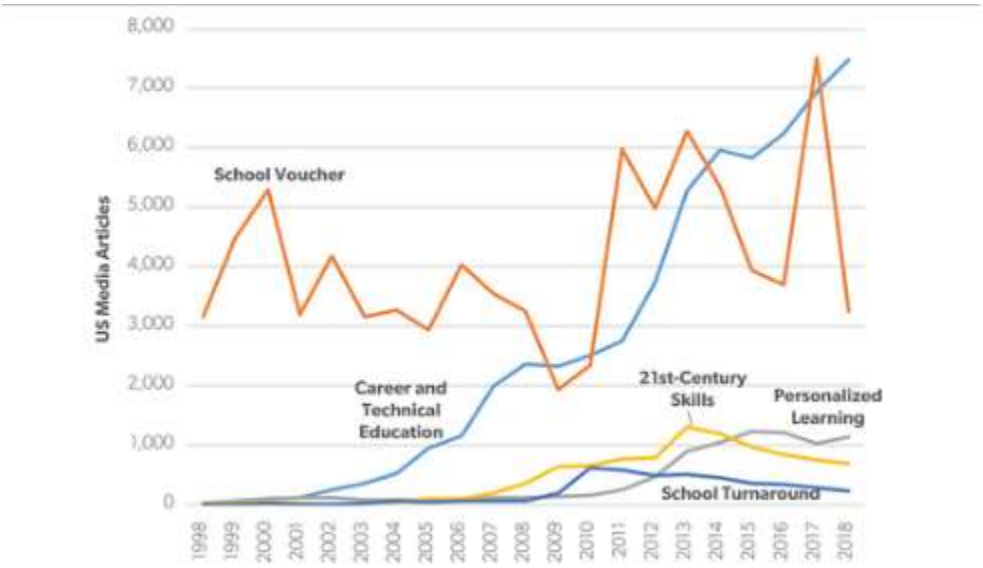


Figure 3

CTE education growth in media attentions (Hess & Martin, 2019).



Post-Secondary Readiness for Students with IEPs

Most of the previous studies focused on examining the postsecondary readiness for students with IEPs in technical high school. However, the U.S. Department of Education Office for Civil Rights (2011) article discussed whether students entering post-secondary institutions are more prepared than their non-disabled peers. The article not only examined the transition of students with IEPs to post-secondary education, but also to the work environment. The article notes that for students with IEPs, accurate knowledge about their civil rights and an in-depth understanding of the emerging technological trends are major key success factors in determining their successful changeover from high school to postsecondary education. The work acts as a framework to guide high school teachers working to support students with an IEP to get ready to move to the postsecondary education environment.

The U.S. Department of Education Office for Civil Rights (2011) has enforcement responsibilities under Section 504 of the Rehabilitation Act of 1973 (Section 504), which prohibits any form of discrimination based on disability. Consequently, all school districts and the majority of colleges and universities within the United States are subjected to this law (Charema, 2013). However, the private postsecondary institutions that fail to receive federal financial assistance are not subject to Section 504, but are bound to Title III of the Americans with Disabilities Act, which prohibits discrimination based on disability by private entities that are not private clubs or religious entities (U.S. Department of Education Office for Civil Rights, 2011). The guide is significant in this study because it makes numerous references to statutes and laws, which are necessary for

providing information concerning the impact of CTE programs on post-secondary readiness for students with IEPs in technical high school.

The guide references the Individuals with Disabilities Education Act (IDEA), which makes available funds to states to assist in making a free appropriate public education (FAPE) available to eligible students with IEPs. The requirements set in the IDEA apply to all state education agencies including the school districts, as well as other public agencies serving IDEA-eligible students with IEPs. However, the institutions of postsecondary education are not bound by legal obligations (U.S. Department of Education Office for Civil Rights, 2011). The guide further references the state Vocational Rehabilitation (VR) Services Program, which is sanctioned by the Rehabilitation Act to provide funds to state VR agencies to help eligible individuals obtain employment. State VR agencies provide a wide range of employment-related services that are meant to transition students with IEPs to employment. Three of the keys to success in achieving post-secondary readiness for students with IEPs involve attitude, self-advocacy, and preparation.

The U.S. Department of Education Office for Civil Rights (2011) views self-advocacy skills and a student's attitude with regards to his or her disability, as major factors in determining their success or failure in postsecondary education. For example, students with IEPs need to be well-prepared to work collaboratively with the institution's disability coordinator to ensure they are provided with an equal opportunity to participate in the institution's programs and activities. Also, the high school teachers may encourage students to understand their disabilities, accept responsibilities, and engage in an appropriate preparatory curriculum to ensure students with disabilities possess the desired

levels of self-advocacy to succeed in postsecondary education. Taking an appropriate preparatory curriculum is essential, as most students with IEPs are expected to meet an institution's essential standards. As such, students with IEPs need to take a high school curriculum that is well-equipped in preparing them to meet these standards (Imperatore & Hyslop, 2017). Unlike the students without disabilities, students with an IEP need to make high school curriculum choices that support that goal by attending rigorous postsecondary institutions. As such, the best CTE program is the one that mandates high school guidance counselors and state VR agency counselors to help students with IEPs in their curriculum planning.

Postsecondary Outcomes for Students with IEPs in Hybrid and Traditional CTE

Postsecondary students with individualized education programs (IEPs) enter the job market well-positioned for the labor market success. After a few years, such graduates start earning more than their non-postsecondary-going peers (Bennett & Gallagher, 2013). Consonantly, adults with higher levels of education enjoy higher median incomes and lower unemployment rates compared to their less-educated peers. While Bennett and Gallagher's (2013) study focused on examining how young students with IEPs carry themselves in school and at the workplace, it provides multiple perspectives with regards to inclusion, which helps in determining postsecondary outcomes for students with IEPs in Hybrid CTE. For the study, the participants held the same views about inclusion, as well as the rights of students in appropriating the delivery of educational programs. However, the majority of employers argue that postsecondary students with IEPs are better supported, thus more effective with regards to creating interpersonal relationships at the workplace.

Dougherty et al. (2018) explored the postsecondary outcomes for graduates with IEPs in hybrid CTE by investigating the impact of career and technical education on students with disabilities. The evidence gathered suggests that participating in hybrid CTE in high school positively affects general education students when transitioning from education to the workforce. Nonetheless, the authors note the lack of large-scale causal research on the academic benefits accrued by students with IEPs. They postulated that similar omissions are conspicuous since students with IEPs are more likely to participate in high school CTE programs at a higher rate than in regular school programs. Dougherty et al. (2018) leveraged multiple years of administrative data from Massachusetts to assess the effect of participating in hybrid CTE on the academic outcomes of students with IEPs. Compared with peers having similar disabilities who do not participate in hybrid CTE, students with IEPs were found to perform comparably on standardized measures of student achievement. However, they were found to have higher probabilities of graduating from high school on time or earning industry-recognized certificates. Dougherty et al.'s (2018) study is significant in the current research, as it has far-reaching implications for practice and policy, especially with regards to scaling access to similar programs.

Unlike the previous studies, Napier et al. (2011) directly examined the transitioning of students with IEPs to Hybrid CTE. Their work is particularly important, as it helps in developing a better understanding of the perceptions held by a student and the faculty. Napier et al. (2011) labeled the transition of introductory computing courses into the hybrid CTE learning models as being essential, especially when it is concentrated on public liberal arts college. They note that hybrid CTE significantly reduces face-to-

face instructions by incorporating rich, online learning experiences. Napier et al. (2011) captured the faculty perspectives on hybrid CTE by gathering written reflections and discussions from the teachers and faculty members tasked with executing the CTE learning sections. The data gathered was analyzed and the results generated indicated that the performance of students was similar in the traditional and blended learning sections.

While the overall student rating for the hybrid CTE programs is deemed better compared to the traditional one, require self-discipline, and the reduced time-management skills and the reduced face-to-face communication pose major challenges, which undermine the postsecondary outcomes for students with an IEP (Napier et al., 2011). The authors add that it is essential to raise awareness about hybrid CTE programs to help people understand what it entails. Also, doing so makes expectations among stakeholders within the education system clearer. It is also essential in providing consistent support to such students throughout the semester. Napier et al. (2011) further added that the faculty can be urged to hold face-to-face office hours through a tutoring center in which students are allowed to seek additional help.

The postsecondary outcomes for students with IEPs in a hybrid CTE program are often undermined by several challenges. Napier et al. (2011) noted that instructors in a hybrid CTE often find it difficult to be proactive in seeking students who might be falling behind and following up with them. Additionally, face-to-face communications allow teachers to develop and leverage cautionary systems within the hybrid courses to alert them on their students' progress. Another problem undermining hybrid CTEs is that students involve the use of multiple technologies. According to Napier et al. (2011), using multiple technologies inside and outside the classroom may frustrate students with

IEPs, who are not technologically competent. Azgur (2011) conducted a comprehensive analysis of student perceptions and teacher intentions of hybrid learning in the computer and instructional technology teacher education programs and urged teachers to be consistent in the way they deliver content to their students (p. 84).

While hybrid CTEs may direct students with IEPs to other websites and tools, "the existence of a central location is deemed as one of the key success drivers" (Azgur, 2011, p. 23). Consistency is essential, as it guides teachers in developing effective teaching plans that students can depend on, especially students with IEPs that have challenges adjusting to face-to-face communication. It is equally significant for such students to find technical support for technologies used to train them in the classroom. Napier et al. (2011) noted that other techniques that might help the students include incorporating lecture podcasts and video tutorials, as well as supplementing reading assignments with clear lesson objectives. Ensuring all the objectives are clear and concise can further motivate and help the students with IEPs in completing their multimedia supported reading assignments.

Napier et al. (2011) further added that classroom tests can be combined with other self-assessment to help students become more actively engaged in the class. The approach is effective as students with IEPs can easily form study groups and help each other succeed. From a faculty perspective, teaching and designing a hybrid CTE for the first time poses numerous challenges (Benz et al., 2000). The faculty needs to develop a comprehensive understanding that the CTE is a complete redesign of the traditional course and requires considerable time for everyone to adjust (Napier et al., 2011; Phelps & Hanley-Maxwell, 1997). Second, hybrid CTEs cause major changes in the teaching

style that further makes designing a course with an appropriate workload for the students with IEPs a more daunting task. Charlevoix's (2008) work examined blended learning in a large-enrollment general education course. The author's findings showed that the hybrid CTEs focus on designing out-of-class activities which is challenging, as such activities are required to have a relevant connection with in-class activities in a manner that supports in-class outcomes.

Ensuring effective training is essential for faculty members to effectively transition from traditional to hybrid courses. Napier et al. (2011) argued that the Hybrid Fellows project was started in 2009 in an attempt to address this need by the Center for Teaching Excellence. The project was focused on promoting the best practices in the development of hybrid courses. These objectives were achieved by focusing on pedagogical theories and introducing relevant online technologies in the classroom. The program further urges all faculty members to be mindful of the demands placed on their institution. Most of the recommendations for the program were brainstormed during an initial workshop held in summer 2009. The faculty participants present were asked to make their inputs in redesigning the existing traditional CTE programs into the hybrid format. The faculty members were required to contribute as students with IEPs in an online hybrid course with case studies, quizzes, group projects, and discussions (Haber & Sutherland, 2008; Napier et al. 2011). By utilizing the responses and experiences reported by faculty members, the hybrid program was revised to become a yearlong faculty development program, which now incorporates a blended learning format combined with video conferencing, face-to-face training, online discussions, and seminars. Thus, the

new CTE plays an essential role in guiding the faculty on the best practices for teaching hybrid programs.

Napier et al. (2011) provided a better overview of the blended learning model. Theobald et al. (2019) further argued that merging online learning with face-to-face class sessions plays a central role in ensuring students with an IEP actively engage in learning. This is more effective when such students are well-prepared and equipped compared to asking them to blindly follow their instructor's timetable. According to Azgur (2011), students with IEPs taking a hybrid course are more likely to report more challenges with the instructional format. Nonetheless, Charlevoix (2008) noted that, overall, such students experience more meaningful and interpersonal interactions with their instructors. Also, the students are more likely to report higher rates of satisfaction with the course experiences by the end of the semester. Furthermore, the students are more likely to perform better in a hybrid learning setting compared to the traditional platforms (Napier et al., 2011). While the faculties are often concerned with finding effective ways for converting direct interactions into a blended format, they acknowledge that Hybrid programs play a central role in building better learning communities, as well as sharing best practices in teaching hybrid learning courses despite the considerable time spent designing them.

Students with IEPs Engagement and Outcomes with Traditional and Hybrid CTE

According to Powell (2018), today's job market is constantly changing for students with IEPs. Most public schools across the United States are actively realigning their education curricula in an attempt to make their students career-ready. Powell (2018) noted that while there are numerous reasons why schools across the country associate

academics with specific careers and these decisions are purely based on economics. Most of the well-paying jobs across the country are in the technology, manufacturing, healthcare, and hospitality industries. Unfortunately, the highly skilled jobs lack someone to fill them up, since there are few qualified individuals (Powell, 2019). Thus, most schools are now focusing on meeting the current societal needs by training their learners in relevant career fields — an observation also made by Yin et al. (2014).

Powell's (2018) work is significant in this study, as it shows that most students are now enrolling in CTE programs that are focused on increasing in-demand career fields. As such, students with IEPs are now better able to access these opportunities, which are crucial for prevocational planning, skill development, and exploration. The opportunities for students play an essential role in improving the learning outcomes for students with IEPs in the mild to moderate classification range often demonstrate promising results with skill obtainment and job procurement. Powell's (2018) work also examined the nature of skill development among students with IEPs. The author claims that such development is a requirement that must be integrated into all CTE programs. Yin et al. (2014) further added that most of the educational reforms and policies are designed to reinforce best practices in the educational systems by implementing standards aimed at supporting the growing need for diploma-earning students. The career approach in high schools and the innovative two-prong college are examples of pragmatic attempts to try and mitigate the skills gap in the United States (Powell, 2018). Thus, students with IEPs need to take advantage of both traditional and hybrid CTE classes, as they aim to provide them with occupational readiness skills.

Powell's (2018) study showed CTE courses share more similarities with the traditional ones and run parallel with the special education courses. Drage (2009) further added that CTE is the present-day label used by stakeholders within the educational system to refer to the specialized material and program courses that place more emphasis on skilled trades and occupational readiness. Association for Career and Technical Education (ACTE; 2009) argued that the primary objective of CTE education for students with IEP focuses on preparing them for career and college endeavors. This objective is similar to the one postulated by special CTE transition goals for students with an IEP (Summers et al., 2014). Drage (2009) argued that at the high school level, both traditional and hybrid CTE programs integrate core academics with the skills necessary to acquire quality employment in the classroom setting. The CTE programs also focus on combining career cluster pathways with academic skills. This helps in ensuring students with IEPs gain the skills necessary to enter the skilled job market. Also, the students experiencing learning differences but successfully participating in CTE are better positioned to leverage industry-level job requirements, as well as develop the soft skills needed to meet their high school graduation requirements and earn high school credits.

There are numerous benefits to increasing engagement for special education students in CTE. The enrollment of students with disabilities in either traditional or hybrid CTEs evidences a significant drop in the high school dropout rate for these subgroups (Powell, 2019). Harvey et al. (2007) argued that a rise in the graduation rates usually results in experiential learning opportunities that are well integrated into the CTE course works. For example, in CTE programs, students with IEPs learn by doing and by applying abstract concepts to concrete learning projects (Garrison-Wade, 2012). As such,

students can learn about different repairs through theory and then apply their skills by doing actual repairs in a setting that simulates an actual work environment.

Additionally, Harvey et al.'s (2007) study found that students with IEPs who participate in a CTE program are more likely to significantly increase their chances for postsecondary success in both employment and academia. As such, students who complete a CTE course have additional skills relevant to a vocationally specific career and are more likely to exhibit an increased tendency to vie for competitive wage jobs, as well as work full time after high school. Wagner and Dintersmith (2015) touched on how education has the potential to change to fit the needs of individuals in a rapidly changing society. The author states that the skills required in today's complicated world are radically different from those required historically, whether students want to earn a decent living or to be an active and informed citizen. Consequently, all the stakeholders, including students and teachers in special education need to develop a comprehensive understanding of the training programs in CTE and how they can potentially increase the outcomes for post-graduation job obtainment for students with IEPs.

The Implications of Hybrid CTE Learning

According to Wu et al. (2014), in the past decade, the interest among teachers to integrate cloud-based education platforms into their classrooms has significantly grown. This growth reflects the increased uptake of technology across the education sector. Wu et al. (2014) further added that compared with other schooling systems, the attitudes held by students about hybrid CTE have not been assessed and thoroughly understood. Also, further studies are needed to examine behavioral intention towards hybrid learning. As such, Wu et al. (2014) set out to examine the Technology Acceptance Model (TAM) in

an attempt to examine the students' behavioral intentions in using electronic portfolio systems. The article is important for the study because it utilizes a questionnaire optimized for hybrid learning. The authors' questionnaire plays an essential role in helping them identify the most effective scales from prior TAM instruments for further analysis. The survey gathered data from 180 students and sought to measure their responses to perceived usefulness (PU), perceived ease of use (PEOU), as well as their attitudes towards usage (ATU). Wu et al.'s (2014) study results showed that students' perceived ease of use (PEOU) has a significant influence on the attitude they have towards usage (ATU). The test conducted to measure the students' perceived ease of use (PEOU) evidenced that there is a significant influence on perceived usefulness (PU). The study results further evidenced that individual characteristics coupled with technological factors and the teachers' training experience have a significant influence on how instructors adopting cloud-based hybrid systems in their courses in vocational education.

Chukwu et al. (2020) argued that while the concept of hybrid learning has been around for some time, its terminology was not firmly established until around the start of the 21st century. Today, the attention on hybrid CTE learning is gradually growing across the world as its perceived advantages and implications become more apparent. Hybrid CTE learning merges elements of the traditional classroom learning with those of eLearning and the concept has started enjoying widespread popularity with the advent of new technologies. While most universities have successfully utilized hybrid learning, most primary and secondary schools are yet to adopt it in their classrooms. According to Chukwu et al. (2020), using know-how to reinforce learning continues to enjoy

exponential growth and most schools are now embracing the hybrid system as their primary approach to teaching.

Sunisloe (2012) believed that Hybrid CTE learning is gradually becoming an essential part of the reforms within the educational system in the past years across the world. Currently, the majority of universities and colleges in the United States have adopted network learning service platforms in an attempt to support teaching and learning. As such, these schools can meet the growing demands of today's learners in both hard and software conditions (Sunisloe, 2012). With the growth of cloud computing technologies, educational service platforms and systems are now becoming more cloud-based than ever before (Chukwu et al., 2020). As such, students with IEPs stand to benefit from the increased capabilities that come with an online-based learning platform.

In the United States, vocational education for students with IEP involves visiting an online platform to take materials that were not provided in the class. Some programs also require students to submit their work online, while others may conduct everything in the cloud from learning to doing assignments (Scott, 2020). Thus, the hybrid approach to CTE learning provides a novel approach for teachers to improve the outcomes of their teaching strategies. Also, it not only creates a quality learning resource sharing system, but also a personal learning space service. Although the vocational learning that is online-based is growing in popularity across the United States and other parts of the world, there are critical questions that remain unanswered (Jones, 2020). First, how do students with IEP view the function and usage of cloud-based vocational education cyber-platform during their hybrid learning in general? Secondly, what are the implications of cloud-based vocational education learning on students with IEPs' learning attitudes, behaviors,

and perceptions about their abilities? Responding to these questions helps to establish the overall implications of Hybrid CTE learning among students with IEP.

Most scholars show that the learning and teaching landscapes are rapidly changing and schools that fail to adapt to these changes are likely to experience low outcomes for their students, especially those with IEPs (Goldhaber & Holden, 2019). According to Aron (2005), the technological growth experienced in the 21st^{t}-century coupled with the widespread integration of these technologies into society has completely changed how information is passed in the classroom. Aron (2005) postulated that today's young students and their subsequent generations will continue experiencing significant growth in the uptake of new technologies. This rapidly changing technology landscape evidenced the fact that traditional CTE approaches must evolve to keep up with the times and incorporate integrated technologies into the learning modal. Thus, hybrid CTE programs will continue being integrated into the society, thereby making it necessary for teachers and students with IEPs to embrace them for the advantages they bring.

The consensus about the definition of hybrid CTE among most scholars is that it is a mixture of teaching methods that incorporate different teaching modals. Most of these approaches and modals focus on eLearning and traditional face-to-face learning (deFur, 2003). Hybrid CTE programs are a natural development to the growing accessibility of online Learning and resources, as well as the continued need for a human component in the eLearning experience for students with IEPs. Deardorff (2020) further noted that blended learning approaches provide learners with an opportunity to remain engaged and driven in achieving their individual and career objectives. These approaches also help in catering to the individual needs of the students with IEPs.

There are several kinds of hybrid CTE programs, each with a different modular design. They come in different sizes, shapes, and can be personalized to fit the individual student's needs. Some of the popular types of models include online-based systems, the rotation, the flex, the personalized blend, online lab, self-blend, and the face-to-face (Schmalzried & Harvey, 2014). Instruction in the online-based systems takes place through online platforms with periodic face-to-face meetings with the students. Secondly, the rotation hybrid model involves students rotating between self-paced online learning and face-to-face instruction. In most cases, the schedules are fixed but flexible so that the teacher can cater to the individual needs of each student with IEP. Thirdly, the flex approach to hybrid learning involves delivering instruction virtually with the educators providing as much support as needed in a small-group setting. Fourthly, the modified blended approach to hybrid learning requires the teacher to design face-to-face systems anywhere, anytime. It is effective as it is not limited by the traditional choices that overlap the regular classroom and virtual spaces. The online lab hybrid module involves delivering instructions in a brick-and-mortar lab by an online teacher but supervised onsite by a paraprofessional. The self-blend approach involves students taking online courses to supplement their traditional schools face-to-face course catalog. Finally, the face-to-face hybrid method requires the teacher to offer face-to-face instructions that are supplemented with technology in the classroom or a computer lab (Schmalzried & Harvey, 2014).

The Future Implications of CTE Learning

The COVID-19 global pandemic had and continues to have a significant impact on most of the foundational aspects of the society, including the education systems and

national economies. With millions of Americans now unemployed and some industry sectors completely shuttered while others are still undergoing rapid transformations, graduates and students with IEPs have been disproportionately impacted (Benitez et al., 2009). Now, more than ever, CTE is vital to the country's learners, employers, and America's economic recovery. While the pandemic's ongoing and long-term impact on the country and across the world has caused great uncertainty, the current studies agree that CTE will remain vital to the recovery process, due to its past proven track record (Reeves, 2016). For example, Wagner and Blackorby (1996) noted that the postsecondary completion rate has nearly doubled for learners with IEPs in CTE programs compared to students in all two-year institutions. Also, about 80% of graduate CTE students with IEPs continue their education or are employed within six months of completing the program (Kohler, 1993).

One of the future implications of CTE learning involves its widespread acceptance across schools with students with IEPs. Through CTE, graduate students with a disability can up-skill and re-skill, thereby preparing them for re-entry into the workforce. Additionally, employers can find a pipeline of well-qualified talent who can adapt to and thrive in the ever-changing world of work. This is particularly significant, because after the last recession, most new jobs were awarded to the employees with more than a high school diploma (Benitez et al., 2009). As the country simultaneously continues to fight the COVID-19 pandemic while responding to the economic downturns that have harmed numerous businesses and families, increasing equitable access to CTE programs will be part of the strategic solutions to the ongoing problem.

These findings are further underscored by a study conducted by the National School Boards Association (2019), which indicated that students who participated in CTE develop key technical skills that is needed for future engagements. In the states of Indiana, Kansas, Massachusetts, South Carolina, South Dakota, and Wisconsin over 90% of students who underwent CTE passed technical skill assessments—with critical employability skills. To this end, it will be essential for the CTE programs targeting students with IEPs to develop and implement new tools that leverage e-learning (Benitez et al., 2009). One of the future implications of such an approach in CTE learning includes helping state CTE leaders make the case for CTE to policymakers and other key stakeholders within the education sector.

Compared to the traditional approach, hybrid learning has far-reaching future implications for students with IEPs. According to Benitez et al. (2009), hybrid learning is significant because it focuses on mitigating the traditional barriers of teaching. For example, students with disabilities can leverage present-day technologies and resources that are tailored to meet their specific learning needs and experiences. Additionally, compared to traditional CTEs, the hybrid ones provide time frames that are more flexible making it easy to personalize them based on the student's needs. As such, they provide students with IEPs with the capabilities needed to learn at their own pace. The COVID-19 pandemic has made hybrid learning more of a necessity than a luxury as schools close and students were forced to learn with the help of online platforms. Training and Board (2019) argued that while teaching CTE courses online or in a hybrid setting is challenging, adapting to the new reality may have long-term benefits for CTE students. Benitez et al. (2009) further added that transitioning hands-on lessons online will make

traditional CTE approaches more flexible and accessible for students with IEPs, thus, allowing them to access lessons anytime and anywhere with a Wi-Fi connection. Such programs also impact students with the digital skills needed to navigate today's highly mobile workforce. Compared to other approaches, the blended CTE is a more cost-effective option for cash-strapped districts.

Demuyakor (2020) noted that the COVID-19 pandemic saw countries across the world implement drastic measures aimed at controlling the pandemic. Most of these measures caused widespread disruptions on a large scale. For example, the global academic calendar was thrown into a state of disarray by the pandemic with most schools from the primary level to universities shutting down their doors and asking their students to return home to observe social isolation directives. At no other time in history have schools utilized video conferencing, video chats, and at-home project assignments more than in 2020 when the COVID-19 pandemic hit hardest. Demuyakor (2020) further noted that making use of "social networks and virtual reality environments significantly enhanced the e-learning process" (p. 8). Consequently, virtual reality lab and simulation tools became a norm with regards to delivering content during the pandemic. Other online platforms such as IBM's Open P-TECH provides learners unique opportunities to further build their skills in using artificial intelligence and cloud computing. However, Goldschmidt (2020) noted that with the adoption of online modalities, students with special needs were highly disadvantaged as the platforms were only meant for students without disabilities. When schools across the United States suddenly closed in the spring of 2020, the majority of CTE teachers were quick to adopt a hybrid approach to deliver their materials to students (Stein & Graham, 2020). Others were asked to create their own

projects, which could be graded online via video chats. Thus, the future implications of CTE learning are that it will continue improving the distance learning experience. The current empirical evidence suggests that schools can provide students with additional methods of staying connected with their peers through hybrid CTE.

Traditional CTE Compared to Hybrid CTE

At their core, traditional and hybrid CTE involves teaching specific career skills to learners (Torok et al., 2014). English et al. (2017) added that both CTE approaches can be split into several career clusters, which are all meant to meet high-demand careers. Both CTE approaches share key qualities. They focus on skills. Surr and Redding (2017) argued that the CTE programs vary from each other in that the hybrid one it is not based on theory. Instead, the emphasis is placed on building practical, hands-on experiences, and application tests that make up the bulk of CTE curricula. This is noteworthy because careers offered through CTE programs require graduate students with IEPs to have experience in their fields before starting a career. Furthermore, most CTE programs are designed to track students to careers that can save or improve lives, such as the health science, government, law, agriculture, and construction industries. As such, Butin (2009) noted that CTE instructors are trained to focus more on reinforcing practice and improvement, rather than textbook memorization.

Secondly, traditional and hybrid CTE applies to almost every educational age range and ability. Preece (1908) noted that this is made possible by the fact that leaners can develop an in-depth understanding of the various fundamentals of any career very early in their lives. Also, students with IEPs can build the essential skills needed to thrive in their future careers. As a result, it is possible to find CTE tracks offered in middle

schools, high schools, and post-secondary institutions. Consequently, students with IEPs can earn the certifications needed to start their careers, many of which are currently in high demand. Similarly, both CTE approaches do not limit students to single careers. Despite the striking similarities, there are major differences between traditional and hybrid, CTEs which ultimately helps in determining whether traditional or hybrid CTEs are best for students with IEPs' post-secondary outcomes. For the hybrid CTE, learning combines both the traditional classroom and online tools (Aron, 2005). As such, teaching is less expensive to deliver, more affordable and saves time. On the contrary, traditional CTE programs are limited within the classroom setting. The hybrid CTE provides additional flexibility with regards to availability. According to Theobald et al. (2019), hybrid learning provides students with increased access to the learning materials that can be accessed from anywhere across the world while enjoying the benefits of direct and interpersonal interactions.

Thirdly, unlike traditional CTE, the hybrid one enables learners to enjoy faster access to key resources and learning materials that are essential in meeting the students' levels of knowledge and interest (deFur, 2003). This is particularly helpful for students with IEPs. Fourthly, the hybrid CTE allows for self-pacing, which is effective for students with disabilities, as well as others whose learning pace is relatively slower than others. As such, the hybrid CTE is deemed more effective with regards to reducing stress and increasing overall satisfaction in the learning process for students with IEPs (Deardorff, 2020). Compared to traditional CTEs, the hybrid one provides an opportunity to develop and maintain more meaningful and effective interactions between the learners and their instructors by using emails, discussion boards, and chat rooms. As such,

students with IEPs are more likely to enjoy increased abilities in tracking their progress throughout the learning process. Hybrid CTE allows students with IEPs to learn through a variety of activities that apply to several different learning styles. For example, eLearning can potentially improve the quality of teaching and learning for students with IEPs, because it supports face-to-face teaching approaches (Benitez et al., 2009). This can play an essential role in increasing student engagement, increasing the retention rate, and reinforcing teamwork.

Based on the literature reviewed, hybrid CTE seems to have more advantages compared to the traditional one. First, it increases student interest. Training and Board (2019) noted that integrating technology into school lessons makes students more interested, as well as focused on remaining at school. Also, the subjects that would normally be monotonous for some, such as mathematics and science become more engaging thereby increasing the overall rate of information retention. Secondly, hybrid CTE keeps the students more focused for longer. Semeniuta et al. (2017) noted that using computers to look up information, combined with the increased access to resources, such as the internet to conduct research ensures the students are more invested in their studies. Thirdly, hybrid CTE reinforces a student's autonomy. Leveraging eLearning materials plays an essential role in increasing a student's ability to set the appropriate learning objectives, as well as take charge of his or her own learning. The approach is essential in helping students with IEPs develop the abilities necessary to help them navigate across all subjects.

Conclusion

The literature reviewed the response to the question of whether students in traditional career and technical education programs are more prepared for post-secondary outcomes than students with IEPs in hybrid technical education programs. The insights generated from the literature suggest that hybrid CTE is more successful than traditional CTE programs in producing a greater post-secondary outcome for students with IEPs. However, a significant gap exists in the current literature on hybrid CTE programming and its benefits. As such, the current study is significant and timely, as it will provide the data necessary to examine the implications of traditional and hybrid CTE on students with IEP's post-secondary outcomes. While there may be some significant difference in postsecondary outcomes for students with IEPs in hybrid CTE programming concerning students with IEPs in traditional CTE programming, the hybrid programs seem to have more advantages than the traditional ones, due to their progressive nature and ability to be flexible toward learners and achieve their objectives. Based on the literature examined, it can be concluded that there are seemingly more advantages to a hybrid CTE experience, leading to enhanced post-secondary outcomes for students with an IEP, when compared to traditional CTE.

Chapter Three: Research Method and Design

Introduction

The primary purpose of this mixed-method research was to evaluate learners' postsecondary readiness with IEPs within two technical high schools: North Technical and South Technical High School, part of Special School District of St. Louis County, or SSD. According to Hafsa (2019), a mixed-method study combines qualitative and quantitative data collection and analysis approaches. Educational research is mainly grounded on theory, making a mixed method the most appropriate for the study. The qualitative aspect of the study used data generated from surveys and interviews, while the quantitative technique used data from the analytics of the survey respondents' 180-day report. This is a report completed by high school counselors in the United States to collect information related to what May graduates are doing 180 days or six months, after graduation. It should be noted that the quantitative approach allowed the researcher to examine the scores of families, students, and teachers concerning the hybrid and traditional CTE programming for IEP learners to assess postsecondary student readiness. This arose from the need to bridge the research gap in this area, especially concerning the use and effectiveness of the traditional versus the hybrid CTE programming for IEP students in the two schools.

Additionally, the qualitative component of the study generated feedback, experiences, and perceptions of teachers, students, and parents or guardians regarding the effectiveness of hybrid and traditional CTE programming in the postsecondary readiness among students with an IEP in the South and North Technical Schools. According to Rahman (2017), the qualitative research method has several advantages, including

producing a detailed and comprehensive “description of participants' experiences, feelings, and opinions” (p. 104) while enabling the researcher to interpret the meanings of their behaviors. Specifically, this was used to gather the feelings, experiences, and opinions of students, teachers, and parents or guardians regarding the traditional and hybrid CTE programming for students with an IEP at the two technical schools. This was beneficial as it allowed the researcher to compare the participant experiences and opinions to identify the approach that increasingly prepares learners for postsecondary life. Qualitative research is also accredited with increased specificity because it enables a researcher to understand participant experiences in a particular environment (Rahman, 2017). It follows that mixing qualitative and quantitative approaches provided the researcher with the best opportunity to investigate and compare the techniques in the two schools chosen.

Presently, there are limited studies on CTE programming with a focus on the hybrid and traditional CTE programming for students with an IEP in technical schools. By comparing the traditional and hybrid systems, the researcher has the best opportunity to help educators (administrators and teachers) make suitable decisions to improve learners’ postsecondary readiness. The researcher was able to identify the best approach to ensure students with an IEP have holistic postsecondary readiness. This study offers schools, teachers, the government, and families, comprehensive information to help them modify or change their systems to provide students with suitable CTE programming to increase their postsecondary readiness in college or directly into the workforce.

Data Collection and Analysis Procedures

After receiving Institutional Review Board (IRB) approval, the researcher began data collection procedures. The researcher was required to have SSD's approval to conduct research before the IRB was approved. The population being sought for the survey were participants who had IEPs at the time of attendance at the technical schools. Working with the school teams at North and South Technical High School, the researcher was able to receive the 180-day report that had been completed for the last three graduating classes (2018, 2019, and 2020). The research was collected from the guidance counselors at North and South Technical High School. Assistance with the collection and formatting of the 180-day follow up data was performed by the secretarial staff at both technical schools. The researcher started with 2018, as this was the first graduating class that experienced the hybrid career and technical education coursework. From this data, the researcher needed to ensure that only graduated students with IEPs who entered a post-secondary institution (e.g., college or university) or directly into the workforce would be surveyed. This same assurance would apply to families of graduates with IEPs. To adhere to FERPA (Family Educational Rights and Privacy Act), any information sent out to families or graduates for this study was sent out via Special School District's Evaluation and Research Department.

The *Qualtrics* survey links were emailed to the Evaluation and Research Department to send out via email. Participation in the survey was voluntary, with respondents having the privilege to withdraw their consent at any time by ignoring the survey. The consent also highlighted that participating in the survey did not subject the respondents to any risk. The surveys took between five and ten minutes to complete. The

survey links for graduates with IEPs and families were sent out, with any participant having the right to opt-out of completing the survey. Only graduates and families with personal emails received surveys. Any school emails were excluded, since the graduates would not have access to school-based email addresses. Generally, electronic mail surveys are advantageous because they are cost-effective and straightforward (Sincero, 2012). The surveys to graduates and families were sent out twice since the first response deadline yielded only two responses. The second time sending out the surveys yielded a total of nine responses from graduates and 11 total responses from families. The table below shows the number of participants (both graduates and family) to whom emailed surveys were sent along with the racial and ethnic background.

Table 2

Racial/Ethnic Background of Participants - Families of Graduates with IEPs

American Indian or Alaska Native	0
Asian	20
Black or African American	45
Hispanic/Latino	5
Native Hawaiian or Other Pacific Islander	3
Multi-Racial/Other	10
White	73
Total	156

Table 3

Racial/Ethnic Background of Participants - Actual Graduates with IEPs

American Indian or Alaska Native	0
Asian	17
Black or African American	93
Hispanic/Latino	10
Native Hawaiian or Other Pacific Islander	6
Multi-Racial/Other	23
White	160
Total	309

Teacher-level surveys were sent to each building administrator at North and South Technical High School. The researcher used this method to ensure transparency with the study and help support a greater number of responses. Teacher-level surveys were also sent out twice by administrators. Responses for teacher-level staff were also lower than anticipated, with only 24 responses (North Technical = 17 responses and South Technical = 7 responses). From the respondents, six teachers consented to an online interview.

The Lindenwood University consent form was listed at the beginning of each survey form for the graduates, family, and teacher level. The consent form contained instructions and the purpose of the survey, the type of survey chart, and the average time for completing the questions. This information was contained at the introduction of the survey form. Further, the surveys also informed the participants that their responses would be included in the dissertation and promised anonymity of participant information.

As mentioned earlier, this study used a mixed method, which combines the qualitative and quantitative research, to generate insights from the study population. The qualitative method used interviews and surveys with a Likert Scale, through *Qualtrics* for data collection. These approaches are best suited for the research because they enable the investigator to gather accurate and holistic data. This included participants' feelings, opinions, and experiences with the CTE programs and students' postsecondary readiness for real-world situations, including the employment sector. Further, the quantitative method entailed the gathering of numerical data from the 180-day report and running a two-tailed *t*-test using Microsoft Excel. This test allowed the researcher to determine whether the null hypothesis would be rejected or accepted for this study.

Data were also collected through online interviews. According to Opdenakker (2006), an interview is a qualitative data collection approach that gathers information related to participant feelings, opinions, experiences, and descriptions of the real-world situation. In an interview, the interviewee is often knowledgeable in the focus area and can answer the questions asked correctly. While interviews can be done in different ways, this study adopted the online technique. Here, based on the teacher-level staff electing to be interviewed via the survey, an email was sent out to the teacher-level staff member to set up an interview time. Following the same process as the surveys, a similar consent form was sent at the introduction of the email. The purpose of the interview was to discuss the teacher's perspective regarding learners with IEPs and their postsecondary preparation outcomes within the technical education sector. It is essential to note that every participant in the interview was voluntary. All the interviews were also recorded through Zoom and logged for later qualitative use in the study. Interviews through the internet have increased tremendously as computer technology continues to evolve and transform the world.

The surveys and interviews sought to gather information concerning the participants' opinions and experiences with the hybrid and traditional CTE programming and their influence on students' postsecondary readiness. The first part of the graduate technical survey and the teacher-level technical interview sought to know whether the participants attended North or South Technical High school. This was measured in percentages based on the response rate. The family survey examined participants' satisfaction level with the graduates' CTE experiences at the technical schools. Further, the family members were asked to provide reasons why they selected a specific

satisfaction level. Another significant component of the questionnaires was to assess the level of participant satisfaction with the CTE program as it prepared the graduate for the job market, their approval of the instructors who took the graduates through the CTE program, and the fulfillment with the soft skills training the graduate acquired in the CTE program at the technical institutions. To test the influence of hybrid or traditional CTE programs, the survey asked the participants to identify the type of CTE program the graduate studied at the technical schools. It also required the respondents to identify their race or ethnicity, to identify the level of diversity within the study sample.

Surveys

The survey used in this study was derived from a previous survey in the report entitled, "The Value and Promise of Career Technical Education," published by Advance CTE (2017). The report was a national survey that shared results from current and prospective parents and current and prospective students interested in career and technical education (see Figures 4 and 5).

Using similar satisfaction metrics information in this report, the researcher then created a Likert-based survey for families and graduates. A Likert scale is a type of rating scale, often found on survey forms or questionnaires, that measures how people feel about a topic or item (Britannica, n.d.). A separate Likert-based survey was created for teacher-level staff at both technical schools, seeking to collect each teacher's satisfaction level of comfort with instructing, supporting, and preparing students with IEPs. One final question on the teacher-level survey asked for volunteers interested in being interviewed via Zoom to gain more in-depth insights. The interview questions asked more 'how and why' questions from the teacher-level survey.

Figure 4.

Excerpt from survey on current and prospective CTE students' satisfaction.

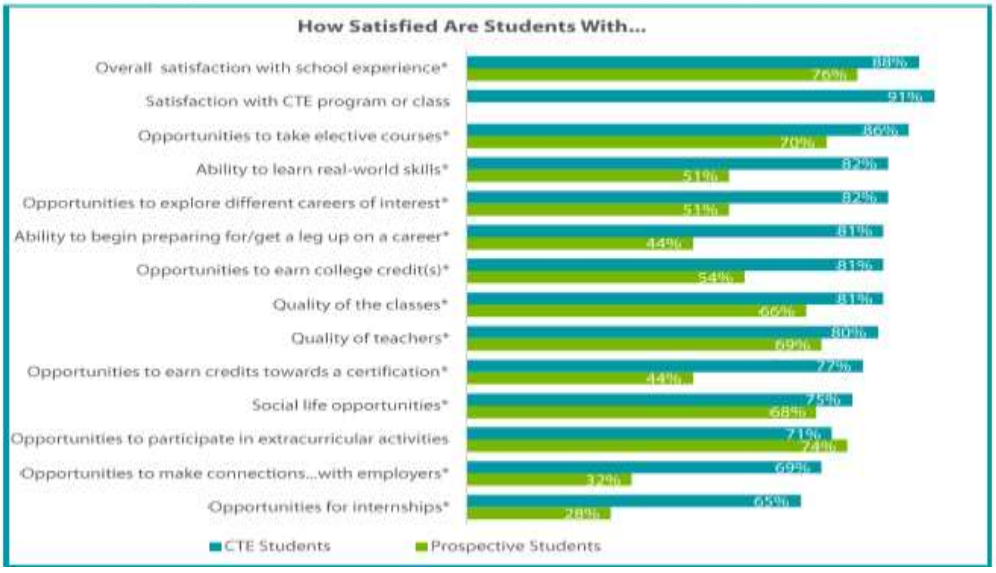
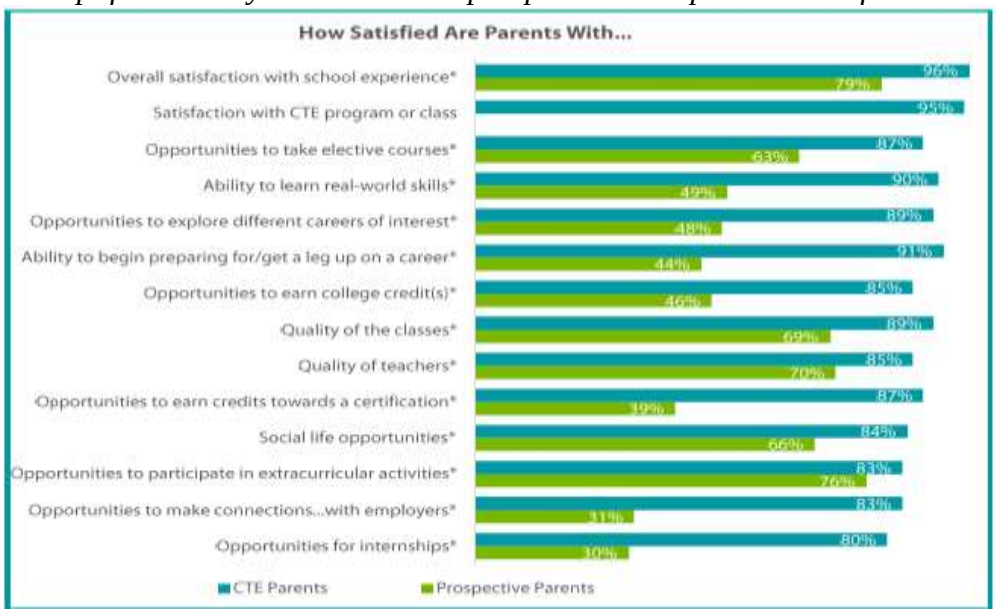


Figure 5.

Excerpt from survey on current and prospective CTE parents' satisfaction.



Participants

Participants of this study included the following populations:

- Teacher-level staff at both North and South Technical School,

- Students who graduated from North Technical or South Technical High with an IEP in 2018, 2019, or 2020
- Families of students who graduate from North Technical and South Technical High School with an IEP in 2018, 2019, or 2020

It should be noted that teacher-level staff has reference to certified teachers in each building and guidance counselors. The table below shows the number of teacher-level staff that qualified to be participants in the study.

Table 4

Number of Teacher-Level Staff at North Technical and South Technical

North Technical High School Teacher-Level Staff	South Technical High School Teacher-Level Staff
61	43

'Families' have reference to any adult relative, family friend, or guardian whom the graduate was living with at the time of their attendance. This information was acquired from information logged in Tyler Student Information System (SIS) for North and South Technical Schools. The study excluded the school administrators because they spend limited time with learners in comparison to the teacher-level staff, who prepare students for their postsecondary outcomes. As stated previously in this chapter, surveys for graduates, families, and teacher level were sent out twice. The first round of surveys was sent the first week of September 2021. The initial survey had a two-week completion window. After reviewing the number of responses from graduates, families, and teacher-level staff, the surveys were sent out again the first week of October 2021. Again, a two-week completion window was implemented for the surveys. The second time sending out

the surveys yielded a total of ten responses from graduates and 11 total responses from families. As noted previously in this chapter, responses for teacher-level staff were lower than anticipated, with only 24 responses (North Technical = 17 responses and South Technical = 7 responses). From the respondents, six teacher-level staff members consented to an online interview. The racial and ethnic background for respondents of all three surveys are found in the tables below.

Table 5

Racial and Ethnic Background of Survey Respondents - Graduates

Please select your race/ethnicity		
American Indian or Alaska Native	0.00%	0
Asian	0.00%	0
Black or African American	40.00%	4
Hispanic/Latino	10.00%	1
Native Hawaiian or Other Pacific Islander	0.00%	0
White	50.00%	5
Prefer not to Answer	0.00%	0
Total	100%	10

Table 6

Racial and Ethnic Background of Survey Respondents – Teacher-Level Staff

Please select your race/ethnicity		
American Indian or Alaska Native	0.00%	0
Asian	0.00%	0
Black or African American	20.83%	5
Hispanic/Latino	0.00%	0
Native Hawaiian or Other Pacific Islander	0.00%	0
White	79.17%	19
Prefer not to Answer	0.00%	0
Total	100%	24

Table 7

Racial and Ethnic Background of Survey Respondents - Family of Graduates

Please select your race/ethnicity		
American Indian or Alaska Native	0.00%	0
Asian	9.09%	1
Black or African American	18.18%	2
Hispanic/Latino	9.09%	1
Native Hawaiian or Other Pacific Islander	0.00%	0
White	63.64%	7
Prefer not to Answer	0.00%	0
Total	100%	11

School Based Report (180-day Follow up Report)

As defined in Chapter One of this dissertation, the 180-day follow up report is a report completed by school counselors in the United States to collect information related to what May graduates are doing 180-days or six months, after graduation. The 180-day follow up report for North and South Technical High School was conducted by guidance staff and secretarial staff at the respective high schools. In order to gather this information, guidance counselors used multiple communication avenues to reach graduates. In some cases, the counselors may need to rely on a family member to report on a graduate's whereabouts and post-graduation endeavors, such as college, military, or workforce (either related or unrelated to the technical class they completed). All the information is self-reported by a graduate or family member. If a graduate or their family is unable to be contacted, the guidance staff must report that graduate as 'Status Unknown.' The 180-day follow up reports for North and South Technical High School (2018-2020) are in Appendix A of this study. For this study, the information needed for data analysis was from students with IEPs that graduated from hybrid and traditional

CTE coursework for the graduation years of 2018, 2019, and 2020. To protect against FERPA (Family Educational Rights and Privacy Act), the researcher asked for guidance staff at each technical high school to review each report and only report the graduates with IEPs that reported either they attended a post-secondary university or college or directly entered the workforce. Table 3 in Chapter Four shows the information given to the researcher in relationship to the 180-day follow up report for graduates with an IEP from both Hybrid and Traditional CTE coursework.

No student names were given to the researcher, nor was personally identifiable information was shared from this report such as race or nationality. Based on this data, a two-tailed *t*-test was conducted to assess if graduates with IEPs from hybrid or traditional CTE coursework had more successful post-secondary outcomes. Success was measured by a graduate self-reporting attending a post-secondary entity, such as college or university or entering the workforce, either related or unrelated to their CTE coursework. The two-tailed *t*-test was used to accept or reject the null hypothesis in this study.

Interviews

The interviews for the teacher-level staff were all conducted in the first two weeks of November 2021. The researcher set up the interviews using an online scheduling tool. The scheduling tool had several dates and times to choose for each teacher-level participant to select. Most of the interviews took place during a teacher-level staff member's plan time, yet two interviews occurred after the school day ended (one interview was at 3:00 pm and another was at 4:30 pm). Allowing flexibility in the interviewing process was necessary to acquire the most authentic, unguarded responses from the teacher-level staff. Four of the teacher-level respondents for this interview are CTE teachers and two respondents are content area teachers (Social Studies-Teacher 5 and Math-Teacher 4). All the respondents for this interview work at North Technical High School. Of the five CTE teacher-level staff for the interview, here are the technical classes they instruct:

- Fashion Design (Traditional CTE)-Teacher 1
- Hospitality and Hotel Management (Traditional CTE)-Teacher 2
- Construction Innovations (Hybrid CTE)-Teacher 3
- Math Teacher (Traditional CTE)-Teacher 4
- Social Studies Teacher-Teacher 5
- Law Enforcement Teacher-Teacher 6

The respondents for this interview have varying levels of experience in education. The most senior respondent has approximately 30 years in education, while the most novice respondent has been in education for five years. The most senior respondent was the only teacher to volunteer from the Hybrid CTE instructional staff. The racial/ethnic

representation of the respondents of this interview were equally split between 50% African American/Black and 50% Caucasian/White. The staff interviewed for this study were instructors whom the researcher worked with previously, therefore there was little difficulty establishing rapport. Before starting the interview, each teacher-level staff member was sent the Lindenwood Consent Agreement via email. Each member checked the box consenting to being interviewed and was also informed that the interview would be recorded to ensure accurate representation of questions and responses. All six participants gave their informed to consent to be interviewed and recorded via videoconferencing (Zoom). Each participant was interviewed separately to ensure that each response was self-derived and not influenced by another respondent.

At the beginning of each interview, the study's definitions of a Hybrid CTE and Traditional CTE were shared visually on Zoom with each respondent. Throughout the interview, each question was shown to the respondent. For example, when Question 1 was asked, the teacher-level staff member could see the question as it was being asked. Next, Question 2 would be on the screen, as the question was being asked. This was the process followed for all seven questions. The researcher utilized this technique from observation of other interviews during the current school year. This technique appeared to allow respondents to understand and answer easily. Additionally, sharing information in multiple modalities, is a solid instructional strategy for retention of information. As mentioned earlier in this chapter, interview questions sought to dig deeper into the "how and why" from the *Qualtrics* Teacher-Level Survey. The following are the seven questions posed to the teacher-level staff in this interview:

1. In your experience, do you believe that technical education is beneficial for students with an IEP? Explain your rationale for this response.
2. How can technical education align with a student's post-secondary transitional goals noted in their IEP?
3. What types supports do you receive to help your instruction of students with IEPs?
4. If any, are there any additional supports that would help you in preparing students with IEPs for post-secondary readiness?
5. Based on your experience, do more students with IEPs study hybrid technical education or traditional technical education at your technical high school? Explain why you answered this way.
6. In your experience, which CTE programming is more beneficial for students with an IEP: hybrid CTE or traditional CTE? Explain why you believe this one is more beneficial.
7. In your experience, does hybrid CTE programming lead to the same post-secondary outcomes for students with IEPs in comparison to traditional CTE programs? Explain your rationale for this response.

Using this form of multi-modal presentation format, very few questions needed to be repeated by the researcher. Participants were able to look at their computer screen to ensure full understanding and completion of the question. At the end of the interview, two asked if they could receive a copy of the completed study or dissertation, to which the researcher agreed to upon post-defense.

Summary

The study sought to investigate student postsecondary readiness with IEPs in two technical high schools. The research used a mixed-methods approach that encompasses the qualitative and quantitative research. Data were collected through surveys, interviews and a school-based follow up report. The study used different categories of participants, including family, graduates, and teacher-level staff from North or South Technical High school. Data were assessed to measure satisfaction as a former student with an IEP, a family member, and as a teacher-level staff member. A two-tailed *t*-test was performed to determine whether the null hypothesis would be accepted or rejected. Chapter Four will review the results of the study.

Chapter Four: Presentation of Data

Introduction

This study included one hypothesis and six research questions. Data collection through survey responses proved more difficult than anticipated (see Appendix A). However, the researcher was able to obtain data from multiple data points as "to ensure that their recommendations and conclusions reflect the quality of the evidence reviewed" (Hong et. al., 2019, p. 3). Other methods included interviews, graduate follow up data from 2018, 2019, and 2020 (known as 180-day follow up data) from North Technical and South Technical High Schools. A two tailed *t*-test was conducted on the 180-day follow up graduate data from students with IEPs. The 180-day follow up graduate data is a report completed by high school counselors in the United States to collect information related to what May graduates are doing 180 days or six months, after graduation. There are standard categories that each counselor will mark, such as 'Employed,' '2-year or 4-year college/university,' or 'Unknown Follow-Up Status.' The information is collected into a report that is shared with each state's Department of Elementary and Secondary Education (DESE) agency. Details surrounding the hypothesis and research questions follow.

Data Collection and Analysis Procedures

The survey questions for families and graduates were based on a study conducted by ACTE (Advance Career and Technical Education, 2017) entitled, "The Value and Promise of Career Technical Education: Results from a National Survey of Parents and Students." In the study, parents and students were asked several questions about their overall satisfaction with Career and Technical Education experience. For the purposes of

this study, the researcher utilized a Likert scale (Level of Agreement) with all participant surveys:

- Strongly Agree
- Somewhat Agree
- Neither Agree nor Disagree
- Somewhat Disagree
- Strongly Disagree.

It should be noted that while the surveys for families and students had the same questions, the survey for teacher-level staff was different. The survey for teacher-level staff sought to examine their readiness in preparing students with IEPs for their post-secondary outcomes. In addition, the researcher collected demographic information related to race/ethnicity, technical school attended, and which CTE program(s) they studied. In some cases, this resulted in participants selecting more than one program.

Surveys

The participation for the surveys was sparse with all participants involved. The researcher attributes this to the procedure used to acquire participants. Due to FERPA (Family Educational Rights and Privacy Act) policy provisions related to educational records, the surveys needed to be sent out by Special School District's Evaluation and Research Department on behalf of the researcher. This becomes even more sensitive when considering that the population being sought out was students with IEPs and their families. The Evaluation and Research Department sent the *Qualtrics* survey link to the families and graduates via email (for those families with follow-up contact information). Evaluation and Research considered sending out the surveys via text message, but

decided against it as the department does not have a secured text message channel. It should be noted that respondents to the surveys were graduates from traditional career and technical programs and their families. Though a definitive rationale to this is unknown, a conjecture could be made that a graduate respondent may have been in a hybrid career and technical program their Junior year and then transition into a traditional career and technical program. This practice is a common instance in both technical high schools. It should also be noted that not all families had accurate follow up contact information at the time of the survey disbursement. This fact adds credence to the previous conjecture above.

Survey disbursement for staff was completed with the assistance of administrative teams at North and South Technical High School. Both administrative teams were given the links to share from the researcher with their respective teacher-level staff. The idea from the researcher's perspective was that staff would be inclined to complete the survey if it was sent from their immediate supervisors. Though the survey was sent out twice, based on conversations from the administration, the responses were still meager. This also includes the interviews of teacher-level staff, as the researcher was only able to interview six staff members, exclusively from North Technical High School. The research questions posed for this study will be answered through the shared results from the surveys, interviews, and 180-day follow up report in this chapter.

RQ1: What are the perceptions of students with IEPs regarding their readiness for post-secondary outcomes in traditional CTE coursework vs. hybrid coursework?

Table 8

Question Six from Qualtrics Graduate Survey

Q6	My CTE program prepared me for working in the industry or attending college/university	
Answer	%	Count
Strongly agree	55.56%	5
Somewhat agree	33.33%	3
Neither agree nor disagree	11.11%	1
Somewhat disagree	0.00%	0
Strongly disagree	0.00%	0
Total	100%	9

Question six on of the survey helps to answer research question number 1. Of the nine respondents, 55.56% strongly agree that their CTE program prepared them for working in the industry or attending college/university, while 33.33% of respondents somewhat agree that their CTE program prepared them for working in the industry or attending college/university. Approximately 11% of students neither agreed nor disagreed that their coursework prepared them for post-secondary outcomes.

Question 7 gives evidence that respondents believe that their CTE experience helped prepare them for their desired career path or post-secondary outcomes, such as the workforce or college/university. Over 55% of graduates strongly agreed their CTE experience gave them an advantage, while over 44% of graduates somewhat agreed with this statement.

Table 9

Question Seven from Qualtrics Graduate Survey

Q7-My CTE experience gave me an advantage towards my desired career path		
Answer	%	Count
Strongly agree	55.56%	5
Somewhat agree	44.44%	4
Neither agree nor disagree	0.00%	0
Somewhat disagree	0.00%	0
Strongly disagree	0.00%	0
Total	100%	9

RQ2: What are the perceptions of CTE teacher-level staff regarding the alignment of students with IEPs towards post-secondary transitional goals in traditional CTE coursework vs. hybrid CTE coursework?

Of the 24 teacher-level staff respondents, most believe that their students with IEPs post-secondary transitional goals align with the CTE coursework. The transitional goals spoken about in this question refer to the goals within an IEP that are designed to help students and their families plan career and life goals upon high school graduation. While approximately 87% of respondents either ‘Strongly agreed’ or ‘Somewhat agreed,’ 12.5% gave neutral responses, neither agreeing nor disagreeing with Question 5.

During the teacher interviews, a question was posed to teacher-level staff: ‘How can technical education align with a student’s post-secondary transitional goals noted in their IEP?’ One of the responses from the teacher-level staff remarked, “The transition goals are a roadmap for during and after high school. Being in technical education, this can help students and their families make good plans for the future.” Another teacher-level staff member said this:

Technical education is student-focused and student-driven. That is, students are exposed to various tech programs or shops and then they decide which career/technical training path to pursue. Working with the school's counselors, educators, administration, and the parents/stakeholders the post-secondary transitional goals can be defined and attained with efficacy.

Table 10

Question Five from Qualtrics Teacher-Level Staff Survey

Q5- I believe the instructional goals of my program align well with the post-secondary transitional goals in my students' IEP		
Answer	%	Count
Strongly agree	37.50%	9
Somewhat agree	50.00%	12
Neither agree nor disagree	12.50%	3
Somewhat disagree	0.00%	0
Strongly disagree	0.00%	0
Total	100%	24

Additionally, another teacher-level staff member made this observation about technical education, “It gives them direct access to the necessary skill development and training as well as the various career pathways and opportunities Tech Ed provides.”

In reviewing the surveys and the interviews, these data points show that most teacher-level staff agree that technical education helps support transition goals for students with IEPs.

RQ3: What are the perceptions of parents regarding key indicators that demonstrate their child with an IEP has post-secondary readiness in traditional CTE coursework vs. hybrid CTE coursework?

Table 11

Question Seven from Qualtrics Family Survey

Q7- My graduate's CTE program prepared them to work in the industry of study and/or college/university		
Answer	%	Count
Strongly agree	54.55%	6
Somewhat agree	27.27%	3
Neither agree nor disagree	0.00%	0
Somewhat disagree	9.09%	1
Strongly disagree	9.09%	1
Total	100%	11

Table 12

Question Eight from Qualtrics Family Survey

Q8- My graduate's CTE experience gave them an advantage towards their desired career path		
Answer	%	Count
Strongly agree	54.55%	6
Somewhat agree	18.18%	2
Neither agree nor disagree	9.09%	1
Somewhat disagree	9.09%	1
Strongly disagree	9.09%	1
Total	100%	11

Questions 7 and 8 assist in answering research question number 3. Question 7 has 11 responses from families and in those responses, either or most agree that there are key indicators of their graduates' post-secondary readiness. A similar pattern of agreement is noted in Question 8 when families were asked about the advantage that CTE provided toward their desired career path. Approximately 27% of families that responded with either a neutral (neither agree nor disagree), somewhat disagree, or strongly disagree on

Question 8 create a higher percentage than the ‘Somewhat agree’ contingency of families, with just a little over 18%.

RQ4: What are the perceptions from the 180-day follow up studies regarding students with IEPs and their post-secondary readiness in traditional CTE coursework vs. hybrid CTE coursework?

School Based Report (180-day Follow Up Report)

For the purposes of this study, the 180-day follow up primarily focuses on graduates that have entered the workforce directly or college/university. Graduates from both traditional and hybrid CTE coursework had greater concentrations entering directly into the workforce in comparison to college or university. South Technical has a larger population of students reported in the 180-day follow for the years between 2018 and 2020, therefore allowing for a larger response of graduates from both traditional and hybrid CTE graduates.

The study included a null hypothesis in which the researcher intended to perform a two tailed *t*-test from the data collected in the 180-day follow up report to determine if evidence existed to reject the null hypothesis below. The following paragraph gives information regarding the null hypothesis.

Null Hypothesis (H_0): There will be no difference in post-secondary outcomes for students with IEPs in Hybrid CTE programming when compared to students with IEPs in traditional CTE programming.

For the purpose of this study, post-secondary outcome success was one of the following: College/University or entering the workforce (i.e., job or career pathway studied while in the technical school). A two tailed *t*-test of unequal variances was

conducted using the data collected from graduates with IEPs at the time of their graduating in 2018, 2019, and 2020 from both technical high schools. This *t*-test was conducted since it could not be determined with absolute certainty that an exact variance in data existed. The significance level used in this *t*-test was .05. Table 13 shows the data used to conduct the two-tailed *t*-test for this study. Column 1 shows the number of graduates with IEPs from North Technical and ends with graduates from South Technical, with successful post-secondary outcomes. For the purpose of this study success is measured by students with an IEP entering the workforce or attending post-secondary education (college or university). This was data reported on the 180-day follow up report collected by the guidance department at either North or South Technical High School. The data in columns 2 and 3 show the number of students with IEPs within that graduating year, with successful post-secondary outcomes. No personally identifiable information was shared with the researcher for this study.

Based on the results from the two tailed *t*-test, the *p*-value is .006, which is less than the level of significance, .05. Therefore, the null hypothesis must be rejected. The *t*-test provides quantitative evidence of the difference in post-secondary outcomes for students with IEPs in Hybrid CTE programming when compared to students with IEPs in Traditional CTE programming. The data shows that students who graduated from traditional CTE programming, with an IEP, had more post-secondary outcomes when compared to their hybrid CTE counterparts with IEPs.

Table 13

Total Number of Students with IEPs from Traditional and Hybrid CTE Coursework with Successful Post-Secondary Outcomes (2018-2020)

Column 1	**Column 2**	**Column 3**
Graduation Year and School	Hybrid CTE	Traditional CTE
2018-North Technical	10	30
2019-North Technical	12	27
2020-North Technical	8	22
2018-South Technical	15	61
2019 South Technical	18	53
2020-South Technical	13	40
Total	76	233

Table 14

Results from the Two-Sample t-test of Data from students with IEPs in Traditional and Hybrid CTE Coursework

Column1	Column2	Column3
Mean	12.66666667	38.83333333
Variance	12.66666667	238.9666667
Observations	6	6
Hypothesized Mean Difference	0	
df	6	
t Stat	-4.040544944	
P(T<=t) two-tail	0.006798519	
t Critical two-tail	2.446911851	

RQ5: What are the perceptions of CTE teacher-level staff regarding their ability to prepare students with IEPs for post-secondary readiness in traditional CTE coursework vs. hybrid CTE coursework?

Table 15

Question Three from Qualtrics Teacher-Level Survey

Q3- I feel very well prepared being the instructor for students with IEPs		
Answer	%	Count
Strongly agree	37.50%	9
Somewhat agree	54.17%	13
Neither agree nor disagree	4.17%	1
Somewhat disagree	4.17%	1
Strongly disagree	0.00%	0
Total	100%	24

Table 16

Question Four from Qualtrics Teacher-Level Survey

Q4- I have enough support available when implementing the accommodations and for students with IEPs in my program		
Answer	%	Count
Strongly agree	41.67%	10
Somewhat agree	45.83%	11
Neither agree nor disagree	8.33%	2
Somewhat disagree	4.17%	1
Strongly disagree	0.00%	0
Total	100%	24

Question 3 from the teacher-level survey shows that most respondents feel well or somewhat well prepared for instructing students with IEPs. Question 4 also reinforces that teacher-level staff feel capable, as evidenced by the support available. Almost 88% of respondents believe they have the support necessary to instruct students with IEPs.

This is also supported in interviews when teacher-level staff were asked, 'What types supports do you receive to help your instruction of students with IEPs?' Here are some of the responses from teacher-level staff:

- Teacher 2: "There are special education teachers that I can always call with questions, and they are able to help with tests for students. We also get a snapshot to help us understand how to support each student."
- Teacher 3: "I can ask questions about what accommodations mean and how it looks in the classroom and on tests."

The teacher-level staff interviewed were asked directly which career and technical education was more beneficial, hybrid or traditional CTE. The respondents were divided on their responses. Two teachers (Teacher 3 and Teacher 5) responded that traditional was more beneficial, as there are more pathways towards a career for students with IEPs. Another instructor (Teacher 3) believed that a hybrid model could work just as well as a traditional career and technical model; this would depend on the instructor's ability to individualize instructions. Another teacher (Teacher 1) observed that the computer-based classes were beneficial for both traditional and hybrid students, as this would be a skill needed now and into the future. Finally, there were responses from teachers acknowledging that hybrid courses were a good 'starting point' for some students, yet students would transition from a hybrid CTE course into a traditional CTE course.

RQ6: What are the perceptions of students with IEPs regarding the soft skills training they received in their coursework to prepare them for post-secondary outcomes in traditional CTE coursework vs. hybrid coursework?

Table 17

Question Five from Qualtrics Graduate Survey

Q5- My CTE experience helped me to learn real-world skills		
Answer	%	Count
Strongly agree	66.67%	6
Somewhat agree	33.33%	3
Neither agree nor disagree	0.00%	0
Somewhat disagree	0.00%	0
Strongly disagree	0.00%	0
Total	100%	9

Table 18

Question Nine from Qualtrics Graduate Survey

Q9- I had opportunities to make connections with employers in my CTE field of study		
Answer	%	Count
Strongly agree	66.67%	6
Somewhat agree	22.22%	2
Neither agree nor disagree	0.00%	0
Somewhat disagree	0.00%	0
Strongly disagree	11.11%	1
Total	100%	9

Most graduate respondents for Questions 5 and 9 believed that the soft-skills training received in their respective CTE coursework did give them an advantage. Soft-skills training (a combination of people skills, social skills, communication skills, character traits, attitudes, career attributes, social intelligence and emotional intelligence that enable people to navigate their environment, work well with others, perform well, and achieve their goals) was able to be enhanced during experiences with employers. During these sessions, students had the opportunity to engage in mock interviews and

internships. These experiences likely led to the responses selected by graduates in this survey.

Interviews

Interviews with teacher-level staff were also conducted. Teacher-level staff could voluntarily elect to be interviewed, based on their final response in the *Qualtrics* survey. The researcher was able to interview six teacher-level staff. The staff members interviewed were comprised of instructors from content area, traditional CTE and hybrid CTE. All the respondents were instructors at North Technical High School. The interviews were conducted via Zoom and recorded individually during each teacher's plan time or after their contracted time (interview times were selected based on the instructor's preference). The interviews yielded some very open and honest conversations from the teachers. While the interviewed group was small, it was diverse. The teachers were numbered by the order in which they were interviewed:

- Fashion Design (Traditional CTE) -Teacher 1,
- Hospitality and Hotel Management (Traditional CTE) -Teacher 2,
- Construction Innovations (Hybrid CTE) -Teacher 3,
- Math Teacher (Traditional CTE) -Teacher 4,
- Social Studies Teacher-Teacher 5, and
- Law Enforcement Teacher -Teacher 6.

During these recorded interviews, the teachers were able to provide their insights and their actual experiences with students that have been in both hybrid and traditional career and technical classes at North Technical High School. A continuous theme across the respondents of the interviews was the value in technical education for students with

IEPs. Teachers believed that technical education provided equitable opportunities for students with IEPs to learn a valued skill, have explicit training in soft skills, and engage with employers regularly. Another theme across respondents interviewed was that more students with IEPs were enrolled and graduated from traditional CTE coursework. One teacher interviewed highlighted that traditional CTE was more beneficial, as evidenced by the amount of traditional CTE class vs. hybrid CTE class remaining (approximately three to four classes). Teacher-level staff had some suggested supports to help their students with IEPs in their classes, which included attending IEP meetings (teachers can understand how a student learns content best), having special educators co-teach in their classes, or having a teacher's assistant or paraprofessional provide supports in the classroom. One interviewee said that a co-teaching model was used over 20 years ago, with two technical education teachers sharing student instruction.

When asked if hybrid CTE coursework led to the same outcomes as traditional CTE coursework, most respondents in the interviews stated that it did not. Some teachers cited lack of rigor in the hybrid CTE coursework, while another teacher responded that they could not see how the coursework in Hybrid CTE was leading to successful post-secondary outcomes for students. Other teacher-level staff were uncertain, or others saw the post-secondary success for students with IEPs being measured on a case-by-case basis (whether the student was in Hybrid or Traditional CTE).

A key aspect that arose in the teacher-level interviews centered around advisory boards. An advisory board is a requirement for all traditional CTE classes; however, this is not required for Hybrid CTE courses. Because of this difference, teacher-level staff interviewed highlighted this as a reason to support the benefits of traditional career and

technical coursework. During the interview, one teacher shared these few hybrid classes are in the process of being dissolved or merged into a traditional CTE course. This process would allow every student and instructors at both technical schools to receive the benefits of an advisory board. Advisory board members would be able to offer internship, mock interviews, and even monetary support to students in the CTE course.

Conclusion

Post-secondary readiness and success for students with IEPs were measured during this study both quantitatively and qualitatively. While quantitative results demonstrated that there is a difference in post-secondary outcomes for students with IEPs when comparing traditional and hybrid career and technical education coursework, most survey respondents believed most graduates had the tools to be successful after high school graduation.

Graduates with IEPs had very positive responses when surveyed regarding the instruction received, the quality of their instructor, and the opportunities related to post-secondary experiences. Families of graduates with IEPs also had similar positive responses when surveyed about the instruction, quality of instructor, and access to opportunities for post-secondary. It should be noted that most of the respondents for graduates and families were heavily represented by those who attended South Technical High School.

Teacher-level staff responded that they were equipped to prepare students for post-secondary success, whether in the traditional or hybrid career and technical setting. Along with this same level of confidence to prepare students, some teacher-level staff included they could benefit from an additional adult in the room. This would provide an

additional layer of support for students and the instructor. Teacher-level staff agreed that traditional career and technical education courses more readily led to successful post-secondary outcomes for students with IEPs when compared to their hybrid counterparts. This conclusion from teacher-level staff was noted because of the access to employers through the advisory board and opportunities to experience more career pathways during their CTE program. Chapter Five will consider the conclusions and recommendations to help support career and technical education for students with IEPs in the future.

Chapter Five: Discussion

Several aspects can be established from the study at this time to help in coming up with meaningful conclusions on the way forward for technical education related to students with an IEP. First, from the results of the study, it can be noted that traditional CTE programming is more beneficial than hybrid CTE programming. This is due to the impact on families and more so the students with IEPs, after completing their high school education (Zhang & Li, 2019). Secondly, from the results of the study, it can be noted that career and technical education is very critical in improving both the post-secondary school readiness and the post-secondary school outcomes through equipping learners with soft skill training to help them maneuver through the job market either by getting into gainful employment or successfully completing post-secondary education. The training also helps learners in meeting the goals within their transition plan as they move from high school into the post-high school activities. However, the primary question in this study was to determine whether the traditional CTE is the best suited method for carrying out this process or whether a hybrid CTE program is better suited.

Whereas CTE simply means career and technical education referring to the practice of equipping learners with necessary skills that can be used as they transition from high school level of learning to several other levels, a hybrid CTE refers to a system aimed at including a population of students that require a more gradual pace of information acquisition. The primary distinction between this type of learning and the traditional one is that there is an explicit effort to differentiate instruction based on the learning style of each student. In other words, a hybrid CTE is divided into various components that make it possible for different learners with varying needs to be

incorporated and to be also instructed in a way that has been customized to meet their own needs. A traditional CTE program is bound by career and technical standards and this level of customization is not readily embedded into the curriculum.

Hypotheses

Null Hypothesis: There will be no significant difference in post-secondary outcomes for students with IEPs in Hybrid CTE programming when compared to students with IEPs in traditional CTE programming.

Alternative Hypothesis: There will be a significant difference in post-secondary outcomes for students with IEPs in Hybrid CTE programming when compared to students with IEPs in traditional CTE programming.

Based on the results from the two-tailed *t*-test, the null hypothesis was rejected. Based on the quantitative results from the 180-day follow up report, there was a significant difference with graduates from a hybrid CTE with an IEP entering the workforce or attending a post-secondary college or university, in comparison to a graduate from a traditional CTE program. The significant difference in the computation from the two-tailed *t*-test evidenced that students from a traditional CTE with and IEP had more successful post-secondary outcomes than their hybrid CTE IEP graduate counterparts from 2018 through 2020. The 180-day follow up report is completed by high school counselors six months or 180 days after May graduation. This report is completed by various methods such as telephone calls or emails. Additionally, it should be noted that all the respondents for this study were graduates from a traditional CTE program.

Research Questions

For the purpose of this study, there were six research questions. Most of the questions sought perceptions of graduates with IEPs, their families, and their teacher-level staff, including counselors. One research question (RQ4) used data from a report completed by high school counselors and then shared with the Department of Elementary and Secondary Education (DESE). The inclusion of counselors was because these staff members meet with students in their technical courses to help shape their post-secondary options and opportunities. These perceptions were captured through a *Qualtrics* survey, sent out via email addresses. For teacher-level staff, volunteers were interviewed for more in depth understanding of their abilities to effectively instruct and support students with an individualize education plan (IEP).

As mentioned at the outset of Chapter Four of this study, respondents were not as plentiful as the researcher would have hoped. A rationale for lack of participation could possibly be aligned with several factors. Some of those factors are how the survey was delivered to each participant's email; the email address aligned with the graduate was their email when enrolled in high school, fatigue from technology (surveys were given at a time when many students were returning from virtual learning at home), and non-interest with participating in the survey topic. The researcher made conclusions with the most available data to date.

Respondents of the study were mostly white and this pointed to a possible need of having CTE programs that are relevant to each demographic. Whereas there is a need in reducing or eliminating the racial disparities in education, it is important to appreciate that most of the members of minority communities do not go past high school levels of

education. As such, there is a need of having CTE programs that have been customized based on ethnic groups, so that the specific needs of each ethnic group are met. This will ensure that members of these communities who complete their high school education are in a position to still reach successes in their lives to get into gainful employment or self-employment.

From the families and graduates that were surveyed in the study, it is clear the majority of them enjoyed their overall CTE experience as they recorded that they strongly agreed with the assertion that their CTE experience was generally great. This points to the aspect of the importance of public approval. An educational program that does not have public support or positive perception is doomed and more likely to fail, unlike a program where members of the public attest to its efficiency and viability. This was also in line with the question of whether the graduate in every family interviewed enjoyed their CTE programs, to which majority of the respondents answered to the affirmative.

It is also crucial that any CTE program positively impacts the student and provides them with the necessary life skills that make it possible to appropriately engage in life activities. This was also affirmed by many respondents who responded positively to the question of whether their CTE experience helped them to learn real-world skills. To this, most of the respondents said that they strongly agree, implying that they obtained skills that were of great benefit in their post-secondary life. This points further to the efficacy of having a CTE program that is not only effective, but one that also does its best to attend to specific needs of different learners. This follows the demographic variables

that were listed before as well as other unforeseeable factors that may make a learner to pursue a different path upon completing high school education.

Recommendations for Practice

One key recommendation would be the implementation of a co-teaching model in technical education coursework. Co-teaching refers to the use of two teachers teach in one class. This co-teaching model would include one technical education teacher and a special education teacher in a classroom. This would further improve the teaching process as done by the main teacher. work in conjunction with teachers who deal with the regular education model. Murawaski (2004) noted the following about co-teaching, "Based on this possible interpretation, co-teaching is becoming an increasingly more desirable, and for some, a more feasible, service delivery option… co-teachers jointly plan and conduct instruction in a coordinated fashion to ensure the success of all students" (p. 55) For instance, there could be a content area teacher who is an expert in Graphic Design in a class, and a special educator who supports with differentiating and scaffolding instruction for each learner.

Having co-teachers may appear as additional workforce that may require aspects such as additional pay. However, the truth is that it makes it easier to provide a hybrid form of CTE when co-teaching is used as opposed to when the content teachers are also used to implement the concepts of hybrid CTE (Kursch & Veteska, 2020). For a district such as Special School District, this cost will not affect the district as much. Most of the educational workforce for Special School District of St. Louis County is geared towards varying forms of special education.

Another recommendation is for the tenets of hybrid and traditional career and technical education to be combined. This would allow the benefits of both programs to be realized for students, teachers, and families. As the results of the study demonstrate, there is a significant difference in the outcomes for students with IEPs in hybrid career and technical education, when compared to traditional career and technical. Combining the two programs will allow for greater outcomes and access to more consistent post-secondary opportunities, such as certifications and internships. In the current hybrid CTE model, those last two options are not readily or consistently available.

A third recommendation is having a more robust training for technical educators related to research-based instructional strategies. Most technical educators did not graduate from traditional education courses. Certification of technical educators in most cases is based on experience and then enrollment in a two-year course through a college or university with the ability to certify technical educators. While most technical education is hands on, in order for their students to acquire industry recognized credentials (IRC), students must be able to learn and retain the material for later tests. Utilizing research based instructional strategies with fidelity will help to increase success for students and opportunities for future work or education related endeavors.

Recommendations for Future Studies

For studies in the future, it would be recommended to give surveys to students and families before their departure from high school. Often, the plans for a student after graduation are known and many times are listed in a graduation program. Incentivizing the survey completion would also be a novel recommendation for a future study, as this is a proven way to increase the respondent turnout. Based on the research of Eleanor Singer

(2012), incentivized surveys do increase response rates. Another student group to survey is our middle school population. The seeds for technical education begin to be planted during this time. Measuring input from students, families, and instructors can help project forecasted needs in the labor force. A fourth recommendation for future studies would be to incorporate school administrators and their perception when compared to teacher-level staff. Being able to compare and contrast the two groups who prepare students with IEPs in varying ways could yield even more beneficial data points for future studies. Finally, future studies should evaluate how COVID-19 has affected the learning losses for students with IEPs when compared to their non-disabled counterparts in technical education. The disruption to learning was felt by many students, teachers, and families. Collecting data on the effects on this topic would be beneficial for education programs, post-secondary institutions, and workforce.

Conclusion

CTE programs are clearly beneficial to learners in their post-secondary life. Graduates, families, and teachers alike believe in career and technical preparing students with IEPs for success. It is even more clear that many learners would benefit from the combination of a hybrid and traditional CTE program of study. As such, there is a need to incorporate a more customized form of CTE that supports equalizing the post-secondary outcomes for students with an IEP. This is not advocating diminishing the standards in each technical program, yet, scaffolding support to help students with IEPs reach post-secondary success in their chosen career field.

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Appendix A: 180-Day Follow up Report for North Technical and South Technical High School (2018-2020)

180 day Follow up Report
2018 - 2020
North Technical High School

Year	Concentrator/ Graduate	ER	ENR	CER	CENR	MR	MNR	NA	OTH	UNK	TOT P	MSIP %
2020	358	59	66	108	57	14	0	0	21	33	304	304
		17%	19%	30%	16%	4%	0%	0%	6%	9%	85%	85%
2019	349	76	48	117	31	11	0	0	17	49	283	283
		22%	14%	34%	9%	3%	0%	0%	5%	14%	81%	81%
2018	372	68	61	146	26	12	1	2	16	40	314	314
		18%	16%	39%	7%	3%	0%	1%	4%	11%	84%	84%

South Technical High School

Year	Concentrator/ Graduate	ER	ENR	CER	CENR	MR	MNR	NA	OTH	UNK	TOT P	MSIP %
2020	419	48	80	164	78	16	0	3	24	6	386	386
		11%	19%	39%	19%	4%	0%	1%	6%	1%	92%	92%
2019	412	65	60	167	82	3	11	0	10	14	388	388%
		16%	15%	41%	20%	1%	3%	0%	2%	3%	94%	94%
2018	419	60	55	209	54	16	0	1	12	12	394	394
		14%	13%	50%	13%	4%	0%	0%	3%	3%	94%	94%

Concentrator/Graduate - Student enrolled in CTE program, 1.0 (state requirement) or
(1 1/2 at Tech, 1 semester) units of credit in CTE program and graduates from high school.

ER	Employed Related-(Incl. combination educ./related work & IEP students Employed Not Competitively)
ENR	Employed Not Related-(Includes IEP students Employed Not Competitively)
CER	Continuing Education Related (includes 2 yr/4 yr/non-college institutions)
CENR	Continuing Education Not Related
MR	Military Related
MNR	Military Not Related
NA	Not Available (Jail, pregnant, dead, etc.)
OTH	Other- Not Placed in work or schooling
UNK	Status Unknown (Unable to obtain information)
TOTP	Total Placed (Actively doing something.)
MSIP%	TOTP minus ENR (Emp. not related) **PRIOR TO 2014 GRADUATE TOTP MINUS ENR**

Appendix B: Racial/Ethnic Representation of Completed Survey Respondents

Racial/Ethnic background for Graduates

Please select your race/ethnicity		
American Indian or Alaska Native	0.00%	0
Asian	0.00%	0
Black or African American	40.00%	4
Hispanic/Latino	10.00%	1
Native Hawaiian or Other Pacific Islander	0.00%	0
White	50.00%	5
Prefer not to Answer	0.00%	0
Total	100%	10

Racial/Ethnic background for Teacher- Level Staff

Please select your race/ethnicity		
American Indian or Alaska Native	0.00%	0
Asian	0.00%	0
Black or African American	20.83%	5
Hispanic/Latino	0.00%	0
Native Hawaiian or Other Pacific Islander	0.00%	0
White	79.17%	19
Prefer not to Answer	0.00%	0
Total	100%	24

Racial/Ethnic background of Family of Graduates

Please select your race/ethnicity		
American Indian or Alaska Native	0.00%	0
Asian	9.09%	1
Black or African American	18.18%	2
Hispanic/Latino	9.09%	1
Native Hawaiian or Other Pacific Islander	0.00%	0
White	63.64%	7
Prefer not to Answer	0.00%	0
Total	100%	11

Appendix C: Letter of Approval from SSD to Conduct Study

June 2, 2021

Ms. Esthere Scott
12110 Clayton Road
Town and Country, MO 63131

Dear Ms. Scott,

I am pleased to notify you that your application for conducting research with SSD titled: *A study into hybrid CTE programming vs. traditional CTE programming for students with IEPs at two technical high schools* has been accepted. This acceptance indicates that we have examined your application and granted permission to conduct research with Career Technical Education schools' students, families, and staff.

This acceptance is conditional upon receipt of university IRB approval. Please forward us a copy of the approved IRB when it becomes available.

This approval is valid for one year. If you anticipate that data collection will extend beyond that timeline, please contact us. We would appreciate notification of any significant changes to your research design. We also ask that you share the findings of your study when complete.

If I can further clarify or answer questions related to the permissions granted, please do not hesitate to contact me. Please work with our office to finalize procedures for recruitment and data collection. Thank you and good luck with your research.

Sincerely,

Matthew Traughber, Ph.D.
Evaluation and Research Administrator
(314) 989-8520
mctraughber@ssdmo.org

Appendix D: Interviews with Teacher-Level Staff about Hybrid vs. Traditional CTE

1) **In your experience, do you believe that technical education is beneficial for students with an IEP? Explain your rationale for this response.**

   Teacher 1: "Yes, I do think it is. I have seen how technical education has been able for a student to make connections they normally would not make. It can help equal the playing field for opportunities after high school."

   Teacher 2: "Yes, due to most students with IEPs dealing with functional issues. I believe technical education fits better to their standard based IEPs and learning styles."

   Teacher 3: "Yes, it is very beneficial. Technical education helps students to be more employable and they get a better understanding of the working world.

   Teacher 4: "With 33 years of experience in career and technical education and special education, absolutely, training for a specific job skill or a variety of skills help students with IEPs have the same chance for a job."

   Teacher 5: "Yes. I believe research has shown students with IEPs have various styles of learning and technical education is filled with diverse programs and training models. This allows for students with IEPs to experience learning outside of the traditional academic classroom model."

   Teacher 6: "Overall I do believe it can be beneficial for students with IEPs because it not only gives them access to career pathways, it also gives them access to an equitable differentiated learning community. Then it becomes, not only beneficial for students with IEPs, but for the other students as well."

2) **How can technical education align with a student's post-secondary transitional goals noted in their IEP?**

Teacher 1: "From what I know about the IEP, the transition goals are a roadmap for during and after high school. Being in technical education, this can help students and their families make good plans for the future."

Teacher 2: "Again, I would like to believe technical education has more to offer students with IEPs because it provides more of a basis on step-by-step task-oriented approach to learning than traditional education does."

Teacher 3: I know the transition goals are designed to help when students graduate, so depending on their classes, this is going to help students have a better idea of their education and work options.

Teacher 4: By individualizing specific aspects of a particular program. 30 years ago, in a lot of the shops, we had a second teacher that was called a (supplemental teacher) that teacher worked one on one with students with an IEP in the shop and classroom. Both teachers for example (Auto Mechanics) were both certified in Auto Mechanics."

Teacher 5: "Technical education is student-focused and student-driven. That is students are exposed to various tech programs or shops and then they decide which career/technical training path to pursue. Working with the school's counselors, educators, administration, and the parents/stakeholders the post-secondary transitional goals can be defined and attained with efficacy."

Teacher 6: "It gives them direct access to the necessary skill development and training as well as the various career pathways and opportunities technical education provides."

3) **What types supports do you receive to help your instruction of students with IEPs?**

Teacher 1: “I can ask questions about what accommodations mean and how it looks in the classroom and on tests.”

Teacher 2: To be honest, not much of any supports at all.”

Teacher 3: “There are special education teachers that I can always call with questions, and they are able to help with tests for students. We also get a snapshot to help us understand how to support each student.”

Teacher 4: “Math and help with obtaining OSHA 10 certification and Work keys progress. Work keys practice and progress allowed students to qualify for jobs at Boeing. Interviewing skills and communication with perspective employers.”

Teacher 5: “The first support would be certified Special Educator support staff, and another would be school counselors.”

Teacher 6: “I haven't received any supports for students with an IEP, mostly because I haven't asked. I haven't had many students with an IEP over the last few years. I know there are supports available, but most CTE teachers don't know who to call and when. We don't always make those connections. At least that’s true for me. Teachers are so busy, sometimes it's so hard to try to give students with an IEP the one on one supports they sometimes need. I have felt at times like I wasn't helping them as much as I wanted to.”

4) **If any, are there any additional supports that would help you in preparing students with IEPs for post-secondary readiness?**

Teacher 1: "It would be great to be able to attend each of the IEPs for my students so I can see how to best tailor what we learn to goals in the future."

Teacher 2: "Providing a para or TA could be helpful to allow for extra hands-on learning and tasks completion."

Teacher 3: "Go to a more Hybrid CTE model. Smaller classes to allow for more one on one interaction and personal development with students with IEPs. I know that is not always possible in certain programs."

Teacher 4: "Job readiness skills, verbal and written Social skills, being able to communicate with fellow workers and managers effectively."

Teacher 5: "Career Specialists. They could help be a liaison between the families, students, and instructors in the technical shops."

Teacher 6: "None at this time I can think of."

5) **Based on your experience, do more students with IEPs study hybrid technical education or traditional technical education at your technical high school? Explain why you answered this way.**

Teacher 1: "More students with IEPs are doing the traditional tech ed courses. There are way more choices and opportunities to meet future employers."

Teacher 2: "More in the traditional setting because the district seems to be moving away from providing a hybrid option."

Teacher 3: “Traditional technical education. Hybrid technical education seems to be transitioning out. I thought it was a great success in my opinion.”

Teacher 4: “The traditional technical courses, especially since they have been around a lot more. More of our parents and students are more familiar with the traditional courses.”

Teacher 5: “They tend to follow traditional technical education pathways. They often find a shop they like and stick to that one shop.”

Teacher 6: “Definitely traditional but I would be in favor of more of a hybrid model. I have tried to have more of a hybrid model in my class, but it is challenging with large classes.”

6) **In your experience, which CTE programming is more beneficial for students with an IEP: hybrid CTE or traditional CTE? Explain why you believe this one is more beneficial.**

Teacher 1: “Traditional. There are more pathways to a career for students in the traditional. There are only 3 or 4 hybrid and those are going away. Hybrid CTE does provide an opportunity for students with IEPs to attend a technical high school, especially if they have a lower reading level or comprehension troubles.”

Teacher 2: “Traditional is more beneficial. I believe there are more opportunities to meet employers and get the opportunity to learn how to present yourself in the best way for interviews. I haven't seen the hybrid instructors mention the students get that type of experience.”

Teacher 3: “Hybrid is by far more beneficial because it gives the students chance to acquire the skills at their pace and not the pace of the program as in traditional CTE. Hybrid also doesn’t hold the students accountable for skill sets they may not be able to master so in the end the hybrid is more beneficial because it focuses on the student verses the traditional focusing on the program.”

Teacher 4: “It definitely depends on the degree of disabilities that students have. I have seen great success with both.”

Teacher 5: “I would say the computer/tech-based programs seems to better for students with IEPs. There seems to be a diverse approach to learning and mastering skills.”

Teacher 6: “I feel like any program can support a hybrid model. It just depends on the instructor.”

7) **In your experience, does hybrid CTE programming lead to the same post-secondary outcomes for students with IEPs in comparison to traditional CTE programs? Explain your rationale for this response.**

Teacher 1: “I don't believe the hybrid programming does lead to the same outcomes. From what I have seen, the classes are not as difficult. Also, they do not have an advisory board to help keep them on trend with employability concerns.”

Teacher 2: “Not necessarily. That is a student-by-student situational matter. Meaning most students with an IEP struggle and even when they are successful in a hybrid program. This doesn’t necessarily covert to the post-

secondary setting unless there are more universal supports outside of the classroom for the hybrid student. When there are consistent universal supports, I would say the outcomes are relatively the same."

Teacher 3: "Yes in some cases. My first year with hybrid students a male student with an IEP was trained in Welding at South Tech in the Light Duty Manufacturing program. He went on to Jeffco College 2-year program in welding and was named "Most Outstanding Welding Student" in the 2-year college program this year. He has a job with a welding supply company right out of college. That is a success!"

Teacher 4: "To be perfectly honest, I don't know how they could. What are the outcomes for hybrid CTE students? I don't know how the teachers in the hybrid program are working to ensure there are really outcomes for students after graduation."

Teacher 5: "I am not sure about that one."

Teacher 6: "I think a more hybrid model can be beneficial. I think the data would say that traditional models are not working for all students. I can't think of one of my students with an IEP working in in the law industry. This bothers me a lot. I feel like more integration of a hybrid model may be more beneficial in the long run."