

**The Identification and Implementation of Key Characteristics of Exemplary Career and
Technical Education Programs in Rural Areas**

by

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Abstract

The increased demand for a skilled workforce has placed new challenges on rural school districts. Students are provided the opportunity to obtain the skills required to fill the workforce needs through exemplary career and technical education programs. The purpose of this study was to identify key characteristics of exemplary career and technical education programs in rural areas using the criteria for the Advance CTE Excellence in Action Award as the basis for the study.

The descriptive case study design allowed the researcher to provide a rich illustration of exemplary career technical education programs through the eyes of key stakeholders. Data collection from multiple sources included (1) interviews with key stakeholders including career technical directors and career technical program teachers; (2) field observations of students, teachers, and administrators in the identified programs; (3) archival data such as career readiness indicator reports, core indicator reports, and student placement reports from participant career technical education centers in rural Alabama.

Findings from this study indicated that six of the eight criteria used for the Advance CTE Excellence in Action Award were directly evident in the data collected through the interviews with career technical directors and teachers. While one of the remaining two criteria was evident in the documents analyzed during the triangulation of data, the other remaining criteria were implied by the structure and progression of the programs.

The findings of this study indicate that high-quality career and technical education programs included 1) partnerships with industry, education, and community members, 2) college and career readiness, 3) a real-world environment, 4) specific program characteristics including programs of study that provide a rigorous and relevant curriculum which integrates academic and

technical skills creating a clear pathway through secondary education to postsecondary education or the workforce. The findings of this study also included additional elements of exemplary career and technical education. These additional elements were 1) integration of career and technical student organizations, 2) evaluation and 3) specific program characteristics. These additional specific program characteristics included 1) scheduling flexibility, 2) keeping the program facilities and equipment up-to-date, 3) passionate teachers, 4) guidance and relevant professional development for CTE teachers, 5) collaboration across programs, and 6) appropriate student recruitment and placement were all deemed elements of high-quality career and technical education.

While the elements identified in exemplary career and technical education were seen across all rural areas, the implementation was often determined by the location. The differences in implementation were most often due to distance from industry and post-secondary institutions, lack of transportation, and funding.

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Chapter I: Introduction

Approximately 20 percent of the children in the United States live in rural communities (Fishman, 2015), and nearly 10 million students in the U.S. attend rural schools (Johnson, Showalter, Klein, & Lester, 2014). Rural schools face many challenges, including poverty, due to the loss of jobs, economic globalization, and transient and migrant workers. Population decline as a result of families leaving rural areas to seek employment in more urban areas has also played a role in the economic downfall of many rural communities. Children living in poverty account for 20 percent of all children in the U.S. and 26 percent of children in Alabama. Of the 22 counties in Alabama, with 30 percent or more of children living in poverty, 21 of them are rural counties. Among the rural schools in Alabama, 15.8 percent have a free-reduced lunch rate of 90 percent or more. (Carter, Lee, & Sweatt, 2009).

The educational attainment of rural residents has a direct relation to the lack of economic prosperity. The rural South has the lowest educational attainment in the country, with approximately one-fifth of adults in Alabama not having a high school diploma, which is one of several factors that indicate socioeconomic distress in rural areas (Johnson et al., 2014). Thirty-six percent of high school dropouts in Alabama attend rural schools. From 2003-2007 almost 11,000 Alabama students dropped out of high school in rural areas. (Carter et al., 2009, p.8) According to Irvin, Byun, Meece, Farmer, and Hutchins (2012), the lack of educational attainment may, in part, be due to the distance of rural communities from postsecondary institutions that leave rural communities without the necessary skills needed for today's workforce. The need for some type of postsecondary education or training has increased over the past 40 years. During the 1970s, students were able to drop out of high school and obtain meaningful employment and continue to move up the corporate ladder. This is no longer true for

most students due to the increased need for a skilled workforce. This increase in skill requirement has caused a shortage of qualified workers to fill employer needs. The change in skill requirements, economic globalization, and declining rural population have compounded the struggles of rural communities.

Alabama ranks number 2 in rural education priority based on a 5-gauge ranking system used by the Rural School and Community Trust (Johnson et al., 2014). According to their report (2014), almost half of the schools in Alabama are rural and serve 42.2 percent of all students in the state. Among other factors used to assess rural education priority, the National Assessment of Educational Progress (NAEP) scores in Alabama was the lowest in the United States for grade four math and second lowest for grade 8 math.

The integration of academics and career technical education (CTE) through programs of study, hands-on, experiential learning, and project-based learning in which students not only learn the concept but the reasoning behind it and how to apply it has been shown to have a positive effect on the passage rate on exit exams, as well as, gains in reading and mathematics (Castellano, Sundell, Overman, & Aliaga, 2012; Hoachlander, 2008). According to Stone, Alfeld, and Pearson (2008), students who took career technical courses in which math content was integrated significantly increased math scores on traditional standardized tests.

High-quality CTE programs include the integration of academics and career technical knowledge and skills. Students who participate in career and technical education programs that are designed around career pathways are gaining skills that prepare them for postsecondary education, employment, apprenticeships, and the military.

By connecting demanding technical education to challenging academics, CTE transforms both domains. Academic subjects acquire authenticity and real-world meaning, technical

content becomes grounded in scholarship and intellectual rigor. Students come to understand that both are important, and they are, therefore, more likely to emerge from high school, ready for lasting success in both college and career (Hoachlander, 2008, p. 27).

Exemplary career and technical education programs in rural areas provide rigorous and relevant career pathways that engage students in planning for their futures, develop their academic, technical, and employability skills, and provide opportunities for work-based learning and mentorship, all delivered flexibly through different school formats as well as online learning (Association of Career Technical Education, 2015, p. 1).

Students in career technical courses learn through hands-on experiences through project-based learning and work-based experiences, including internships, cooperative education experiences, and apprenticeships. Students are required to apply academic content knowledge in career technical courses through real-world activities. “Their experiential knowledge, in turn, deepens their theoretical understanding. They become more fully educated” (McDermott & Taylor, 2009, p. 35).

Career and technical education have addressed the issue of student disengagement, which results from boredom and the inability to understand the relevance of the required academic subjects. Students who become disengaged from school are at higher risk of dropping out of high school. A mixed-methods study by Plank, DeLuca, and Estacion (2008) found that the lowest risk of dropping out of high school was found for students who took one-third of their courses in career technical education.

Career technical education also prepares them for the workforce as well as postsecondary education. CTE provides industry-recognized credentials, integrated and application academics,

employability skills, non-cognitive skills, and technical skills. CTE courses provide students the opportunity to earn industry-recognized certifications and credentials that are required in specific job areas. Students can earn certifications or stackable credentials in high school career technical programs, which will qualify them for jobs and provide the foundation for an easier transition to postsecondary school or more advanced jobs. CTE provides the skill and knowledge necessary for a skilled workforce to be globally competitive. This study looks at the characteristics of exemplary, high-quality career and technical education programs in a rural school and the availability of high-quality career and technical education for students in rural schools.

Statement of the Problem

Career and technical education have been shown to improve student achievement, prepare students for both college and the workplace, and provide a more rounded education. Workforce needs have changed so that the skills needed to be successful in the current and future labor market have changed. This increase in skill requirement has caused a shortage of qualified workers to fill employer needs. The change in skill requirements, economic globalization, and declining rural population have compounded the struggles of rural communities. CTE provides the skill and knowledge necessary for a skilled workforce to be globally competitive.

While CTE is at the forefront of preparing students to be that skilled workforce, Alabama currently does not have a defined method for identifying exemplary CTE programs. However, the Alabama State Department of Education is currently working on an Evaluation of Quality Instruction of Programs (EQIP) to be completed annually in conjunction with compliance monitoring. There has been little research to identify the key characteristics of exemplary career and technical education programs in rural areas. Therefore, this case study will use the criteria for the Advance CTE Excellence in Action Award (2019) to examine CTE programs in rural areas that have been identified as exemplary.

Purpose

The purpose of this study was to identify key characteristics of exemplary career and technical education programs in rural areas using the criteria for the Advance CTE (2019) Excellence in Action Award as the basis for this study. Rural schools face many challenges, including increased drop-out rates, economic hardship, declining population, and students inadequately prepared for college or career. The increase in skill requirement for a qualified workforce has also placed new challenges on rural school districts. The integration of academics, technical skills, and employability skills in exemplary career and technical education programs provides students with the skills required to fill the workforce needs. In order to add to the limited literature, the researcher interviewed career technical directors and career technical teachers in rural CTE programs that have been identified as exemplary by the Alabama State Department of Education in order to identify key characteristics of these programs.

Conceptual Framework

Due to the increase in skill requirement for a qualified workforce and the shortage of qualified workers to fill the labor force needs, career and technical education must provide high-quality education to meet those demands. The Advance CTE Excellence in Action Award (2019) provided a framework which was used as a basis for this study. In response to the increased requirements for skilled workers, Advance CTE (2019) released a document in 2010 which identified principles for providing excellence in career technical education programs that will prepare a workforce that allows the United States to remain a globally competitive, economic leader. These principles were used to develop the Advance CTE Excellence in Action Award (2019) for exemplary career and technical education programs across the U.S.

Research Questions

The study addressed four questions:

1. Are the elements used as criteria for the Advance CTE Excellence in Action Award evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
2. Are there additional elements evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
3. How do the participants perceive the benefits of exemplary career and technical education programs in rural fringe, distant, and remote settings?
4. What are the challenges of career and technical education programs in rural, fringe, distant, and remote settings as perceived by the participants?

Significance of the Study

Many rural areas are caught in a vicious cycle of poverty, high dropout rates, declining population due to the more educated residents transitioning to urban areas for employment, and economic globalization. Economic globalization and declining population have led to a decline in jobs, decreased tax base, transiency, and increased poverty in rural areas. (Wilcox, Angelis, Baker, & Lawson, 2014) Rural schools face financial hardships due to the lack of a qualified workforce, loss of jobs, and a narrow economy (Carter et al., 2009, p. 6). Providing a skilled workforce is necessary to draw industry and create jobs in rural areas.

Workforce needs have changed so that the skills needed to be successful in the current and future labor market have changed. Career and technical education is a means for providing students with the knowledge and skills needed to be successful in the labor market. CTE provides the skill and knowledge necessary for a skilled workforce to be globally competitive.

There has been little research done to identify the key characteristics of exemplary career and technical education programs in rural areas. This research study will add to the limited

literature on the subject of career technical education in rural areas and provide a model for the implementation of exemplary career and technical education programs. This researcher sought to gain an understanding of the development and implementation of exemplary rural career and technical education programs. Identification and understanding of these key characteristics should be of value to education administrators in rural areas seeking to improve student achievement and provide students the opportunity to gain the skills necessary to be successful in both college and the workforce through career and technical education.

Limitations

1. The study only included rural career and technical education programs in one state.
2. The identification of exemplary programs was limited to career and technical education centers.

Assumptions

1. Participants provided accurate and truthful answers in interviews.
2. Career technical directors and teachers at each school were willing to participate in the study.

Definition of Terms

- Business Industry Certification – An on-site evaluation process by which each Alabama CTE program area is evaluated on a 5-year schedule.
- Career and Technical Education – The National Center for Education Statistics [NCES] (2020) defines career and technical education as courses (at the high school level) and programs (at the postsecondary sub-baccalaureate level) that focus on the skills and knowledge required for specific jobs or fields of work. At the high school level, CTE is sometimes expanded beyond “occupational education” also to include

family and consumer sciences education and courses that provide general labor market skills.

- Exemplary – deserving imitation; commendable; deserving imitation because of excellence (Merriam-Webster Dictionary).
- Programs of Study - A sequenced, non-duplicative progression of CTE courses that are designed to connect secondary and postsecondary curricula and to lead to an industry-recognized credential or certificate at the postsecondary level, or an associate’s or bachelor’s degree (United States Department of Education [USDOE], 2014, p. 14).
- Rural Schools – According to NCES, rural schools serve a community with a population of less than 2,500, which is based on the U.S. Census Bureau (2018) definition. NCES has developed local codes for rural areas that include:
 - (41) Rural - Fringe – Census-defined rural territory that is less than or equal to 5 miles from an Urbanized Area, as well as a rural territory that is less than or equal to 2.5 miles from an Urban Cluster.
 - (42) Rural – Distant – Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an Urbanized Area, as well as a rural territory that is more than 2.5 miles but less than or equal to 10 miles from an Urban Cluster.
 - (43) Rural – Remote – Census-defined rural territory that is more than 25 miles from an Urbanized Area and more than 10 miles from an Urban Cluster.

Summary

This chapter presented an overview of the study of career and technical education in rural schools, the purpose of the study, conceptual framework, research questions, significance of the study, limitations of the study, assumptions, and definitions of key terms. Chapter 2 provides a review of the literature related to career and technical education and rural schools, including the history of career and technical education, funding, and evaluation of CTE, and the challenges and benefits of CTE and rural schools. Chapter 3 provides the methodology used for the study, including the research design, description of participants, data collection procedures, and the data analysis design. Chapter 4 presented the results of the data analysis. Chapter 5 provides a summary of the researcher's findings from the study, implications, and discussion of the findings, and recommendations for further research.

Chapter II: Literature Review

History of Career Technical Education

Although Career technical education has been a component of the American education system for more than 150 years, it has been known by different names. CTE began as technical education at the college level as a result of the 1862 Morrill Land-Grant Colleges Act. Congressman Justin Morrill believed that young men needed more than just the classical academic education but also needed to learn agricultural and mechanical arts (Stringfield & Stone, 2017). Within a few years, technical education had evolved into vocational education where students were taught through hands-on exercises in the use of specific toolsets. The name vocational education remained until 2006 when the name was changed to career and technical education. This name change was “to differentiate the mission of contemporary career-focused education from that of the past” (USDOE, 2014, pp. xiii-xiv).

As the United States moved into the industrial era, the need for skilled workers began to increase. In answer to the cry for more skilled workers, congress passed the Smith-Hughes National Vocational Act of 1917, bringing vocational education into the secondary schools. Although it was intended to increase vocational education in public schools, elements of the Smith-Hughes Act caused vocational education and academic education to be separated. As a result of vocational education intensified. Although limitations set regarding how the funds could be used, the stigma associated with efforts began in the 1960s to move vocational education into the arena with academics in public education, the stigma still lingers today.

Over the past four decades, the labor market has changed significantly. According to Symonds, Schwartz, & Ferguson (2011), in a report released by the Harvard Graduate School of Education, jobs requiring less than a high school diploma decreased from 32% to 11% between

1973 and 2007. The employment rate for 18 to 19-year olds decreased from 51.4% to 28.5% between 2000 and 2010, with a decrease from 74.2% to 62.2% for youth between ages 20 to 24.

Since 1910, the U.S. Department of Labor has been keeping data on occupations, their growth and decline, educational requirements, and wages. This data is presented in the *Occupational Outlook Handbook (OOH)*, which provides projections for ten-year periods and is updated every two years.

The *OOH* projects that both the top three professions in terms of growth in absolute numbers of positions and six of the top 20 are in healthcare. . . Five of these six health-related growth areas require a level of education that can be acquired in either high school CTE “career pathway” concentration or as part of a community college degree” (Stringfield & Stone, 2017, p. 170).

Many occupations listed in the *OOH* with a median wage of \$35,000 per year have entry-level requirements that can be obtained through high school CTE programs.

Integration of career technical education and academic education began to increase after World War II due to increased requirements for successful middle-class wage careers. Efforts to increase the integration of academics and career technical education were focused on meeting student needs as well as the needs of the workforce in economic globalization. Workforce needs have changed so that the skills needed to be successful in the current and future labor market have changed. CTE is a means for providing students with the knowledge and skills needed to be successful in the labor market.

For more than a century, the United States led the world in education; however, we now have approximately one million dropouts each year. The Programme for International Student Assessment (PISA) is administered by the Organisation for Economic Co-operation and

Development to measure “how well students can apply what they have learned in school to novel problems and situations” (Symonds et al., 2011, p. 31-32). The results of the PISA have shown that the U.S. is no longer leading the world in education.

According to Symonds et al. (2011), “the most important reason we’ve lost ground is arguable that some other leading nations have developed superior systems of vocational education” (p. 33-34). Finland, Australia, and New Zealand are a few of the nations that have developed multiple pathways for students to be successful, including vocational education. The students in these nations gain the skills needed for highly skilled positions in the workforce but are also prepared to continue their education at the postsecondary level. Many of these students are completing secondary school with a diploma equivalent to a postsecondary technical degree in the United States (Symonds et al., 2011).

Funding for Career Technical Education

Funding for career technical education dates to the 1862 Morrill Land-Grant Colleges Act, which provided funding for colleges so that young men could learn agricultural and mechanical arts in addition to the classical academic education. Five- and one-half decades later, the Smith-Hughes National Vocational Act of 1817 introduced funding for vocational education at the secondary level. Although the Smith-Hughes Act required the separation of vocational and academic education, beginning with the Vocational Education Act of 1963 efforts, have continued to reconnect academic education and vocational education (Castellano, Sundell, & Richardson, 2017; Shumer, Stringfield, Stipanovic, & Murphy, 2011; Stipanovic, Lewis, & Stringfield, 2012).

Funding for career technical education continued with the Carl D. Perkins Act of 1984, which was then reauthorized as Perkins II in 1990, again in 1998 as Perkins III, and most

recently in 2006 as Perkins IV. The Carl D. Perkins Career and Technical Education Act of 2006 is currently being considered for reauthorization to prepare high school students for both college and career.

The Carl D. Perkins Act has been a major funding source for career and technical education since 1984. The allocation of Perkins IV funding is through Title I basic grants but also originally included Title II grants for Tech Prep; however, funding for Tech Prep was terminated in 2011. Each state receives Title I allocations “using a statutory formula that is based on states’ share of the national population within each of three age groups (15-19, 20-24, and 25-65) and also incorporates an “allotment ratio” based on average per capita income relative to other states” (USDOE, 2014, p. 35). Each state is then required to allocate a minimum of 85% of Title I funds to local agencies, including both secondary and postsecondary education. The amount allocated for each local agency is “based on a formula of 70 percent based on the number of poor children ages 5-17 who reside in the school district and 30 percent based on the total population ages 5-17” (USDOE, 2014, p. 36).

Although Perkins IV remains a major funding source for career and technical education, it has decreased by almost one third in constant dollars or purchasing power overall. From 2000 to 2014, Alabama’s allocation of Perkins funding decreased by 34 percent in constant dollars (USDOE, 2014, p. 40).

Alabama career and technical education is supported through various funding sources, including federal funds, local funds, donations, live work, career technical student organizations, and bonds/grants. The state of Alabama receives federal funds through the Carl D. Perkins Basic Grant then disperses those funds to local education agencies for program improvement and expansion. The Career and Technical Education Division of the Alabama State Department of

Education is responsible for the administration of Perkins IV funding. Federal funds may not be used for consumable supplies and materials; however, those items may be purchased using operations and maintenance funding or local funds.

Perkins IV funds are earmarked for program improvement and expansion and may not be used for anything considered consumable materials and supplies. To maintain career technical programs in the state of Alabama, the legislature has chosen to provide funding that may be used to purchase consumables through operations and maintenance funding. Alabama provides operation and maintenance funding for consumable supplies and materials based on the number of career technical education teachers in each local education agency (LEA) (Alabama State Department of Education [ALSDE], 2018).

The Alabama Administrative Code (Chapter 290-6-1-.08 1b) also requires that the local education agency provide funding that may be used for maintaining existing career technical programs. LEAs must provide \$300 per career technical teacher, plus \$3 per student based on the previous year's enrollment for each teacher. These funds are in addition to the state operations and maintenance funds.

Two other sources of funding for career technical education at the local level include career technical student organizations and live work. Career technical student organizations are an integral part of CTE programs that may assist in funding through dues, fundraising, and donations. Career technical student organization funds are used to provide student activities such as competitive events in each specific program area, leadership training, and related projects (ALSDE, 2018).

Live work is work related to students' specific program area that is performed by students for a fee. Examples of live-work are cosmetology students performing hair care, graphic design

students creating logos or brochures, and carpentry/construction students building woodwork projects (ALSDE, 2018). Each LEA is required to have a board-approved policy for live work that is updated and renewed at least every three years.

All school districts in Alabama receive federal funding for career technical education based on a specific formula. “The formula for figuring your Perkins Allocations, which is figured each year in LEA Accounting is, by law, based upon the following:

- 30% is allocated to local educational agencies based on the number of 5-to-17-year olds who reside in the school district
- 70% allocated to LEAs based on the number of 5-to-17-year olds in families below the poverty line, based on data collected under ESEA” (ALSDE, 2018)

Based on this formula for funding, it appears that all school districts would have equitable funding. However, economic globalization and declining population have led to a decline in jobs, decreased tax base, transiency, and increased poverty in rural areas (Biddle & Azano, 2016; Horst and Martin, 2007; USDA, 2017; Wilcox et al., 2014). All of these factors increase the financial hardship faced by career technical education programs in rural school districts.

Evaluation of Career Technical Education

The reauthorization of Perkins IV brought with it some changes, including the renaming of vocational education to career and technical education. “Provisions within that act caused a refocusing within the career and technical education community due to changes in articulation, testing, rigor, programs of study, and general philosophy. More specifically, there was a renewed focus on assessment and the data that assessment results provide” (Foster, 2009, p. 28).

Accountability requirements in Perkins include assessments that include challenging academic

standards and attainment of technical skills that are aligned with industry standards. Other changes included additional accountability indicators and broadening accountability to include the local education agency. “States were informed that they would need to establish baselines of technical competence, determine how to identify completers, increase the number of completers reported annually and establish a target for annually improving overall technical competence” (Foster, 2009, p. 28). LEA’s are required to meet at least 90% of each of its core indicator targets or may have penalties levied against them, including decreased funding (USDOE, 2014).

Although there are federal accountability measures for outcomes, there is no national framework for evaluating career technical education programs. States have been given the flexibility to establish indicators for measuring student outcomes in career technical programs. However, they do not provide information regarding how those outcomes were achieved. “Furthermore, on their own, they do not provide the information necessary to identify and replicate best practices or to determine appropriate technical assistance for targeted program improvement” (Imperatore & Hyslop, 2015, p. 1). The state frameworks for evaluating CTE programs that currently exist include the integration of academics and career technical programs, partnerships with all stakeholders, alignment and partnerships between secondary and postsecondary education, professional development, technology skills, work-based learning, and performance assessments aligned with industry (USDOE, 2014; Imperatore & Hyslop, 2015; Stone, 2017).

For the past half-century, career and technical education has been served by the National Occupational Competency Testing Institute (NOCTI) for end-of-program testing. “NOCTI assessments meet all the requirements of the accountability section of Perkins, and NOCTI delivers certification services for a number of industries” (Foster, 2009, p. 28). NOCTI provides

longitudinal data that can be used not only to measure student achievement but for continuous planning and improvement.

Perkins IV included accountability requirements in the form of core indicators of performance that each state and local education agency must meet. Each state is allowed to negotiate with the U.S. Department of Education to set performance targets for each indicator. In addition to state target indicators, each LEA receiving Perkins funding must negotiate target indicators with the state agency. Reporting data for each of the core indicators is required for all career and technical education students, as well as, for the same subgroups required for ESEA reporting. States and local agencies not meeting 90 percent of their negotiated targets are required to develop and implement an improvement plan. States and LEAs may have penalties imposed through restrictions on Perkins expenditures or decreased funding if the improvement is not shown for three or more consecutive years (ACTE, 2014).

Perkins IV separated target indicators for secondary and post-secondary education, and two additional indicators were added to ensure the integration of academic standards at the secondary level. There are eight secondary core indicators that each Alabama LEA must meet for career and technical education each year. Those indicators are (a) Attainment of Academic Skills – Reading/Land (d) School Completion (e) Student Graduation Rates (f) Placement (g) Nontraditional Participation Nontraditional Completion (ALSDE, 2018). Each state is allowed to choose how each indicator is measured. In Alabama, the academic indicators are measured using the ACT assessment given in each LEA, while the technical skills assessment may be measured by course completion, earned credentials, or certificates. The remaining indicators are measured based on data reported by the LEA.

All 50 states develop and carry out education policy with limited oversight tied to funding. “Within each state, school districts modify and interpret state policy to run their schools” (Stone, 2017, p. 155). Each state may choose the means for measuring core indicators; therefore, a comparison of career and technical education from the state to state is very difficult.

Per the Alabama Administrative Code 260-6-1-.03 (2), each local education agency will be held accountable for the effectiveness and efficiency of programs according to an approved plan. “Accountability measures include Comprehensive LEA Monitoring (including Methods of Administration for the Office of Civil Rights), business/industry program certification, data collection, and may include teacher and student credentialing” (Alabama Administrative Code 290-6-1-03, p. 2b).

Planning and accountability go hand in hand; therefore, as a part of planning and accountability, each local education agency that provides career and technical education is required to have a system-level advisory council that assists in the planning and accountability process. Each CTE program area offered at the local level is also required to have a program-specific advisory committee to assist with planning and accountability. The system-level advisory council and the program advisory committees are made up of local business and industry representatives who work with the CTE faculty and administration to ensure that the programs offered are meeting the needs of students and industry.

The evaluation of career and technical education programs often includes workforce needs assessments to ensure a labor force that possesses the skills needed by industry. According to Bartlett, Schleif, and Bowen (2011), approximately one-half of the programs studied used workforce needs assessments in the evaluation process. Using workforce development data and labor market data to drive career technical education decisions ensures that students in high-

quality CTE programs are gaining skills necessary for high demand jobs. Workforce needs assessment data may be gathered by a variety of methods, including advisory councils and committees, reports from state and national government agencies, and formal and informal conversations with industry partners. The most commonly used method is through advisory councils made up of local industry representatives (Bartlett et al., 2011).

As a result of the changes to the Perkins Act, many states, including Connecticut, Georgia, Kentucky, Maine, Missouri, New Jersey, Pennsylvania, Texas, and Virginia, have developed standards by which to measure career and technical education programs. Each state has developed its standards and methods to assess how well career and technical education programs are meeting those standards. Maine, Virginia, and Missouri use NOCTI assessments to measure student technical achievement while Pennsylvania, Georgia, New Jersey, and Connecticut have developed state end-of-program assessments. Some of these state assessments include both technical skill attainment and academic competencies. Several states have also implemented evaluation processes for career and technical education programs to ensure quality. Several of these program evaluation and accountability processes include an on-site review followed by technical assistance and gathering evidence of correction and implementation of recommendations.

Alabama's Business Industry Certification (BIC) is an on-site evaluation process by which each CTE program area is evaluated on a 5-year schedule. Each year the local education agency must verify through the program application that each program remains in compliance. The BIC process measures how well a program meets standards that have been aligned with the industry. Programs that do not meet the requirements for business/industry certification are required to take corrective action and attain business industry certification within two years, or

the program will be terminated. Any program that is terminated may not be reopened for at least one year and must meet business industry certification during the reinstatement year (Alabama Administrative Code 290-6-1-.03).

Kentucky has designed and developed specific regulations to ensure that its career and technical education programs are held to high standards of accountability. The Office of Career and Technical Education (OCTE) and the Division of Career and Technical Education in the Kentucky Department of Education were asked to review CTE programs to ensure that accountability measures set by the Commonwealth Accountability Testing System (CATS), CTE regulations, Perkins performance measures, and the Kentucky Occupational Skill Standards (KOSSA), and the Southern Association of Colleges and Schools (SACS) were being met (Helphinstine, Helphinstine, & King, 2008).

Stakeholders, which included business and industry, OCTE, KD-DCTE, two- and four-year postsecondary institutions, teachers, and administrators, worked together to develop an assessment process and program assessment document. The Kentucky CTE assessment process not only ensures accountability but serves as a tool for continuous improvement in career and technical education programs. (Helphinstine et al., 2008)

Kentucky career and technical education programs are reviewed on a two-year schedule with an onsite assessment team visit during year one and a self-assessment during the second year. The onsite assessment team consists of representatives from business and industry, a university, community college, secondary career, and technical education. The assessment team scores the program reviewed using the program assessment document on a 0-4 scale. “A high-quality program is expected to have at least a 3.0 rating” (Helphinstine et al., 2008, p. 27).

Missouri's Office of College and Career Readiness administers career and technical programs that receive state and federal funding.

The Report for Local Program Quality Improvement serves as a tool for school districts to use for program evaluation and improvement. Aligned with the Common Standards for Career Education Programs, the report should be used to evaluate career education programs to determine where exemplary programs and activities exist and where improvements should be made. The use of this tool should positively impact student performance as measured by MSIP and Perkins accountability standards (Missouri Department of Education, 2018).

The general analysis of programs is completed every five years, with a specific objectives-based evaluation completed annually. The general analysis is conducted by the program teacher and program advisory committee.

In Maine, the State Department of Education conducts a comprehensive review of all career and technical education programs with a full on-site review every six years, followed by a report of findings within three months of the onsite visit (Maine State Department of Education, 2018). One and one-half years later, there is a consultation with the programs to provide technical assistance and gather evidence for correction and implementation of any recommendations in the report with an abbreviated on-site visit after three years. Before the full on-site visit, each program conducts an intensive self-study, which takes approximately ten to twelve months.

The Virginia Department of Education also conducts a review on a six-year cycle in three phases over a two to three-year period with a focus on program improvement and student achievement. During phase one, each program conducts a self-assessment followed by a possible

on-site review by the Virginia Department of Education after the analysis of the self-assessment report during phase two. Phase three is a follow-up on identified deficiencies and concerns. (Virginia State Department of Education, 2017).

The Texas Education Agency (TEA), Division of School Improvement oversees the evaluation and review of career and technical education programs. These review processes increase student achievement, ensure program success and that they are operating in accordance with state guidelines (Texas Education Agency, 2020). TEA uses a performance-based monitoring system to evaluate programs along with an intervention system for programs that are identified as not meeting required levels of performance. Programs identified as deficient are provided technical assistance and resources to address program deficiencies and includes a targeted on-site review (TEA, 2020).

The Connecticut Performance Standards and Competencies (PS&C) are nationally aligned standards and competencies developed for each of the 21 areas of concentration in career and technical education. “The PS&C were developed to improve student performance on statewide CTE assessments, academic success and instruction. (Connecticut State Department of Education, 2015).

Advance CTE (2019) (formerly the National Association of State Directors of Career Technical Education Consortium) is a national organization that represents CTE directors and leaders across all 50 states and the U.S. territories. To encourage and support high-quality career and technical education, Advance CTE (2019) presents the Excellence in Action award to exemplary career technical programs across the country based on specific criteria. Schools may submit the Excellence in Action application for one program from each career cluster that is eligible for Perkins funding. Criteria for exemplary programs include:

- 1) Implementing Career Cluster®-based programs of study
- 2) Maintaining effective employer and business partnerships.
- 3) Demonstrating alignment, rigorous and relevant college- and career-ready expectations.
- 4) Demonstrating a clear progression of knowledge and skills and student transitions across secondary and postsecondary systems.
- 5) Integrating successful career guidance and advisement.
- 6) Integrating high-quality work-based learning experiences.
- 7) Highlighting alignment to workforce and employer needs in the community; and
- 8) Providing concrete data on the program of study's impact on student achievement and success at both the secondary and postsecondary levels.

Additional documentation required for the application includes letters of support from employers, education, business, and community partners (Advance CTE, 2019).

Characteristics of Career Technical Education

What is Career Technical Education? Workforce needs have changed so that the skills needed to be successful in the current and future labor market have changed. According to the Association for Career and Technical Education (2015) CTE,

educates students for a wide range of career options through 16 Career Clusters and 79+ pathways; integrates with academics in a rigorous and relevant curriculum; features high school and postsecondary partnerships enabling clear pathways to certifications and degrees; fulfill employer needs in high-skill, high-wage, high-demand areas; and prepares students to be college- and career-ready by providing core academic skills, employability skills, and technical, job-specific skills. (Hoachlander, 2008, p. 27)

Career technical education is a means for providing students with the knowledge and skills needed to be successful in the changing labor market.

Although for many years, students had to choose between an academic pathway and a vocational pathway, the Perkins IV reauthorization brought about changes in name and focused in order to prepare students for both college and career. “The goal of Perkins IV was to develop a seamless system allowing all students the opportunity to prepare for work, college, and life.” (Stringfield et al., 2013, p.i). Through rigorous and relevant curriculum Perkins IV purposed to integrate academics and skill, as well as provide a smoother transition from secondary education to post-secondary education via dual enrollment and articulation. Integrating academic and technical career training provides students with quality education directly related to their career plans. Accountability standards ensure that students are receiving high-quality academic education as well as relevant career training with connections to industry expertise (Hoachlander, 2008; Loera, Nakamoto, Oh, & Rueda, 2013; Stringfield et al., 2013).

Students are no longer required to choose between an academic pathway and a vocational pathway. Career technical pathways integrate academics and rigorous career technical programs to open the door to multiple post-secondary options. Students who participate in CTE programs that are designed around career pathways are gaining skills that prepare them for postsecondary education, employment, apprenticeships, and the military. “By connecting demanding technical education to challenging academics, CTE transforms both domains. Academic subjects acquire authenticity and real-world meaning, technical content becomes grounded in scholarship and intellectual rigor. Students come to understand that both are important, and they are therefore more likely to emerge from high school ready for lasting success in both college and career” (Hoachlander, 2008, p. 27).

Education reform efforts over the past 30 years have failed to increase academic achievement and graduation rates. The majority of entering ninth-grade students do not complete a college degree at either the 2-year or 4-year level. Students have reported boredom and the lack of relevance as causes of disengagement with academic courses and the school itself (Stone, 2017; Stone et al., 2008; Symonds et al., 2011). Disengagement is seen in a variety of actions, including increased absence, increased discipline/behavior problems in the classroom, decreased participation in school activities, and poor peer and faculty relationships. Students who become disengaged from school are at higher risk of dropping out of high school. Career technical education has been shown to have a positive effect on each of these symptoms of student disengagement (Castellano et al., 2012; Stone et al., 2008).

Students are often bored in traditional academic classes and do not understand the relevance of what they are learning. Career technical education increases student engagement by allowing students to see the relevance of their academic learning through application in career technical education courses, internships, and apprenticeships (Bloomfield, Foster, Hodes, Konopnicki & Pritz, 2013; Castellano et al., 2012; Gentry, Rizza, Peters, & Hu, 2005; Symonds et al., 2011). Academic content is an integral part of career-technical courses through application. Students in career technical courses learn through hands-on experiences through project-based learning and work-based experiences. Students are required to apply academic content knowledge in career technical courses through real-world activities. “Students who believe themselves to be working toward a meaningful and obtainable goal are more likely to be engaged in their work” (Gentry, Rizza, Peters, & Hu, 2005, p. 49).

A mixed-methods study by Plank et al. (2008) was conducted using data from the National Longitudinal Survey of Youth 1997. Data was collected on 8,894 students between the

ages of 12 and 16 through surveys, parent interviews, and high school transcripts. This study found that the lowest risk of dropping out of high school was found for students who took one-third of their courses in career technical education. Students with a higher or lower concentration of CTE courses were found to have a greater likelihood of dropping out. Taking more than one-third of courses in career technical education left students unprepared academically for advancement, whereas students with a lower concentration of CTE courses lacked engagement.

Linking secondary education and postsecondary education also brings relevance and engagement for students. College prep students have primarily taken dual enrollment courses; however, the opportunity to earn college credit while in high school is now available for students preparing for both college and careers (Karp and Hughes, 2008). Dual enrollment offers several possible positive outcomes for high school students. According to the study by Karp and Hughes (2008), students who took career-technical dual enrollment courses had a slightly higher grade point average (GPA) than those who did not. CTE dual enrollment students were also more likely to earn a high school diploma and to continue post-secondary education after high school.

Another study found that students who took career technical courses in which math content was integrated significantly increased math scores on traditional standardized tests. However, there was no significant increase in scores on applied math tests (Stone et al., 2008).

Earning college credits while still in high school also has positive effects on students after graduation. “Dual enrollment participation was related to higher grades in college in both locations, indicating that taking a college course in high school can prepare CTE students for success in postsecondary education” (Karp & Hughes, 2008, p. 16). Dual enrollment students also earned a greater number of credits by the time they reached their senior year in college than students who had not taken dual enrollment courses. Collaboration between secondary and

postsecondary schools through dual credit courses allows students to enter college after high school graduation, having already obtained college credits, thus decreasing the time and expense of earning a college degree.

Career technical education not only prepares students for post-secondary education but also prepares them for the workforce. CTE provides industry-recognized credentials, integration, and application of academics, employability skills, non-cognitive skills, and technical skills. CTE courses provide students the opportunity to earn industry-recognized certifications and credentials that are required in specific job areas. Students can earn certifications or stackable credentials in high school career technical programs, which will qualify them for jobs and provide the foundation for an easier transition to postsecondary school or more advanced jobs. CTE provides the skill and knowledge necessary for a skilled workforce to be globally competitive.

Common Characteristics. Efforts to prepare students to be college and career ready have frequently been preparing students to be college or career ready with more emphasis on college readiness. However, college and career readiness should be jointly defined to guide students to a well-rounded education that prepares them for both college and the workforce. “If college and career readiness are not recognized as important for all students, the nation risks perpetuating inequities among student groups that may have a lasting detrimental impact on society” (Malin, Bragg, & Hackmann, 2007, p. 5). During the twenty years from 1990 to 2009, “the average number of occupational CTE credits earned by public high school graduates declined slightly” (USDOE, 2014, p. 20). However, this decline may have been related to the increased focus on academics and changes in graduation requirements to include a larger number of academic courses.

Under No Child Left Behind (NCLB), each state was to create academic standards by which to measure students' performance. Each state creates its own set of standards made it impossible to compare students from state to state or to prepare them for postsecondary education adequately. To address the lack of consistency in academic performance across states, the Common Core State Standards were developed with attention to college and career readiness. The reauthorization of Perkins IV included the integration of academics and career technical education to address the focus on college and career readiness.

With the reauthorization of Perkins IV in 2006 came changes beginning with the name. Prior to Perkins IV, the focus was on the job-specific training known as vocational education. However, the change from job-specific training to the integration of challenging academic standards with rigorous technical knowledge and skill content that prepares students for both college and career called for the change to career and technical education.

Perkins IV not only brought a change in name from vocational education to career and technical education but also brought changes to the structure and accountability of CTE. The biggest change was the requirement of programs of study (POS). Each local LEA is now required to offer at least one program of study.

Career technical education in secondary schools may be found as elective courses in traditional high schools, integrated with academics in career technical high schools, or as the main focus of career technical centers. The structure of Alabama career and technical education follows the 16 industry clusters identified at the national level which include: 1) Agriculture, Food, and Natural Resources 2) Architecture and Construction 3) Arts, Audio/Video Technology and Communications 4) Business Management and Administration 5) Education and Training 6) Finance 7) Government and Public Administration 8) Health Science 9) Hospitality and Tourism

10) Human Services 11) Information Technology 12) Law, Public Safety, Corrections and Security 13) Manufacturing 14) Marketing 15) Science, Technology, Engineering and Mathematics, and 16) Transportation, Distribution and Logistics (Alabama Administrative Code 290-6-1-.01).

Common characteristics of career and technical education are most often connected to the program of study. Each state and LEA receiving Perkins funding must adhere to the requirements of the POS. However, they also have the flexibility to implement programs of study to meet best the needs of the school, students, community, and industry as long as they are meeting the program of study requirements. A program of study must include “a sequenced, non-duplicative progression of CTE courses that are designed to connect secondary and postsecondary curricula and to lead to an industry-recognized credential or certificate at the postsecondary level, or an associate’s or bachelor’s degree” (USDOE, 2014, p. 4). Programs of study may be offered in comprehensive high schools, career academies, career technical high schools, and early college high schools.

The U.S. Department of Education (USDOE, 2014) developed a framework to guide the design of career technical education programs of study. The framework consists of ten components that are intertwined and dependent upon each other for the successful implementation of CTE POS. These ten components include:

- 1) Legislation and policies - Legislation and policies at all levels of government should provide resources and procedures for the design and implementation of programs of study, as well as requiring the development of individual plans for secondary students and participation opportunities for all students.

- 2) Partnerships - Partnerships among all stakeholders are necessary for the effective design and implementation of CTE POS. These partnerships may be in the form of advisory councils and committees which serve as sources for workforce development and labor market data, identification of skills, and assessments currently needed in the workforce. Partnerships also must be established between educational institutions at the secondary and postsecondary levels to ensure students have the opportunity to that lead to postsecondary credits and industry-recognized credentials.
- 3) Professional development - For the effective implementation of programs of study, professional development that supports both vertical and horizontal alignment of the curriculum must be provided for administration and faculty. It is essential that professional development opportunities include effective teaching strategies and are continued and not just a one-time workshop or seminar.
- 4) Accountability and evaluation systems - CTE accountability and evaluation must include data on programs of study as well as student outcomes. A major part of the accountability and evaluation of CTE programs of study include target core indicators that are negotiated by each state and local education agency.
- 5) College and career readiness standards – Programs of study should be based on rigorous academic and technical standards that are designed to ensure that students gain the knowledge and skill needed to continue to postsecondary education or directly into the workforce. The standards should be established with the assistance of all partners in secondary education, postsecondary education, and business and industry in order to ensure that the standards include both academic knowledge and workplace skills that are necessary for all careers.

- 6) Course sequences – Courses offered in a CTE program of study should not only guide students in a chosen career path but also provide opportunities for students to earn college credit for courses taken in high school either through articulation or dual enrollment. Course should be non-duplicative to ensure that students gain more in-depth knowledge and do not require remedial coursework at the postsecondary level. Course sequences should begin with introductory courses in which students learn skills necessary across all career fields and progress to more job-specific courses.
- 7) Credit transfer agreements - Each state or LEA should have credit transfer agreements with post-secondary institutions to provide students the opportunity to earn college credit for courses taken during high school. These agreements should include both articulations for courses taken at the high school level that include the standards taught in courses at the postsecondary level and dual enrollment courses that are college-level courses taught either on the college campus or by a high school teacher with the credentials to teach at the postsecondary level. Credit transfer should provide a seamless transition from secondary to postsecondary education without additional requests for credit required.
- 8) Guidance counseling and academic advisement – Counseling and advisement should include career development counseling that assists the student in choosing the correct program of study for their desires, needs, and abilities. Guidance counselors must have up-to-date information regarding career opportunities, academic requirements, and programs of study being offered in order to assist students in decision making. Information must be provided for both students and parents that will assist them in

preparing for life after high school, whether it is transitioning to postsecondary education or the workforce.

- 9) Teaching and learning strategies - teaching and learning strategies that incorporate both academic and technical standards are essential for the implementation of effective programs of study. Strategies should include contextualized learning that provides real-world relevance, critical thinking skills, problem-solving skills, teamwork, and communication.
- 10) Technical skill assessments - Obtaining the knowledge and skills necessary for entry into a chosen career or continuation into a postsecondary institution in a chosen pathway is the focus of programs of study. Measuring the skill attainment for each program of study should be an ongoing process that leads to an industry-recognized credential or postsecondary degree. Technical skills assessments must be industry approved assessments or developed based on industry standards in areas that do not have existing assessments available for secondary students. It is vital that technical skill assessments include hands-on, performance-based tasks in order to ensure students' level of knowledge and skill (USDOE, 2014).

Typical secondary programs of study include the integration of rigorous career technical education courses and academic courses aligned with post-secondary education in which students can earn college credit and industry-recognized credentials while in high school.

Programs of study are implemented through the creation of an individual learning plan for each student beginning no later than middle school with career development activities beginning before middle school. High school career technical programs of study are then structured in a sequence of three or four increasingly rigorous courses that may include work-

based learning in the form of internships, apprenticeships, and cooperative education and are closely aligned to postsecondary programs, and industry-led curriculum (Hoachlander, 2008; Loera et al., 2013).

Students taking CTE programs of study can earn industry-recognized credentials and college credits while in high school. College credits may be earned through articulation agreements between the local education agency and a community college, 2-year or 4-year college. With an articulation agreement, students may take high school classes and receive credit for those classes at the college with which the LEA holds the agreement after graduating from high school. Alabama has a statewide articulation agreement with all community colleges within the state for specific courses. Dual enrollment allows high school students to take college classes at either the college or classes on the high school campus with a teacher holding the credentials for teaching at the college level.

Another characteristic of career technical education programs is the career technical student organizations (CTSO). Each program area has a student organization that is related to the respective career cluster. Many people may see career technical student organizations as extracurricular clubs while they are an integral co-curricular component of career technical education. Participation in a CTSO during high school provides students with the opportunity to gain professional development knowledge and skills, which can benefit them in their chosen career later in life (Alfeld, Hansen, Aragon, & Stone, 2006).

Exemplary Characteristics. Through participation in career technical student organizations, students are able to better understand the relevance of academics through their application in hands-on activities (Saed & Scates-Winston, 2017). Peer interaction, networking,

and skill-based competitions gained through career technical student organizations help to increase student knowledge and confidence (Saed & Scates-Winston, 2017).

The Obama Administration's 2012 report identified four core standards upon which high-quality CTE would be founded:

- 1) Alignment between career and technical education programs and industry needs.
- 2) Collaboration among secondary education, postsecondary education, employers, and industry partners.
- 3) Accountability through common definitions, clear measures of performance, and data on all student groups to identify gaps in education attainment.
- 4) Innovation in programs through the use of new and state-of-the-art practices, strategies, and programs. (USDOE, 2012)

Career and technical education prepares students for college, careers, and further training. A student's path following high school is partially determined by the courses taken in high school. The most recent reauthorization of Perkins IV in 2006 included the requirement of programs of study in order to integrate academics and career technical education, which will provide students a rigorous and relevant curriculum linked to postsecondary education. Career and technical education pathways provide contextualized learning, mentoring, and work-based learning, as well as the possibility, to earn postsecondary credits (Stipanovic et al., 2012).

“Career and technical education (CTE) provides a viable and realistic solution to curb the dropout rate and encourage transitions into postsecondary. Plus, CTE offers multiple pathways to acquire knowledge and skills for high wage, high demand jobs” (Saed & Scates-Winston, 2017, p. 30). Participation in career and technical education programs increases student engagement and is believed to have a positive effect on the dropout rate. According to a mixed methods study

by Castellano et al. (2012), students in schools where all CTE programs of study requirements were met there was a tendency toward increased academic achievement and a greater percentage of students that are on-track for graduation at the end of the tenth grade.

Pathways in career and technical education are designed around themes. The themes are integrated into academic and career technical courses. For example, academic courses for a student in a healthcare pathway will learn academic concepts through health-related topics. Pathways or programs of study “are designed to produce higher levels of accomplishment in a number of measurable arenas, including grade-level performance on tests of academic achievement, demonstrated mastery of demanding technical knowledge and skill, high school completion, post-secondary transition, and attainment of a formal postsecondary credential” (Hoachlander, 2008, p. 24). Themed career pathways allow students to choose from several pathways to graduation through the integration of technical education and academics. (Grubb & Oakes, 2007, p. 2).

One effective method of delivering CTE programs of study is through career academies, which are small learning communities (Castellano et al., 2017; Thessin et al., 2018). Programs of study taught in small learning communities not only give students the knowledge and skill necessary for postsecondary education and the workforce but also provide the connection students need to increase engagement. Strong relationships with the CTE teacher may develop in which the teachers serve as mentors. Building a strong supportive relationship with students increases student engagement and satisfaction (Castellano et al., 2017; Gentry et al., 2005; Loera et al., 2013; Thessin et al., 2018).

Integration of academics and career technical education are a vital component of high-quality career academies and programs of study. “Effective math, literacy, and science

instruction, when embedded in high-quality CTE programs of study, creates unique opportunities for students to develop the knowledge and skills necessary to engage with CTE content effectively, achieve at high levels, and transition into viable, progressive careers” (Park, Pearson, & Richardson, 2017, p. 193).

Students who see a purpose for their learning experience greater satisfaction and motivation to complete their chosen program. Purpose is achieved through a rigorous curriculum that includes both hands-on experiences and academic learning. The integration of academics and career and technical education is best accomplished through contextualized learning. According to Park et al. (2017), academic concepts are found embedded in the CTE curricula and are taught through specific occupational applications and then to the broader academic concepts. Contextualized learning to integrate academics and CTE improves both academic achievement and understanding of the application of the academic standards in the CTE content. Park et al. (2017) also found the integration of academics and CTE to “remove the disparity between white and non-white science achievement” (p. 199).

A study by Castellano, Sundell, and Richardson (2017) has shown that students taking programs of study have increased achievement, higher grade point average, increased attendance, less student movement out of the program, and increased probability of graduation, as well as, increased probability of transition to postsecondary education. Stringfield et al. (2013) found that programs of study helped “students understand not just why they were learning but also why it was important to know and do things in the real world” (p. 326).

In addition to increased achievement, attendance and graduation rates, a study by Castellano et al. (2017) indicated that students who participated in a career technical education pathway had greater success transitioning to postsecondary education than students who did not

participate in a CTE pathway (p. 85). A recent study by Castellano et al. (2017) also indicated that career technical education programs of study completers have been shown to earn more STEM credits than non-CTE completers, and they tend to have a greater desire to enroll in postsecondary education.

High expectations in a CTE classroom includes not only academic expectations but personal responsibility and accountability. These are products of an environment focused on career preparation, hands-on learning, and work-based learning. Teachers in these programs treat students as employees in order to provide a real-world work environment in which they are held responsible and accountable. “When teachers and leaders have high expectations for students’ postsecondary success, students form a positive and concrete vision for their future, and it motivates them to engage in school and to learn” (Thessin, Scully-Russ, & Lieberman, 2018, p. 55).

Students find opportunities for growth both intellectually and in skills through participation in CTE programs. Students that take career and technical education courses tend to have a greater awareness of available careers in their chosen career cluster and are more likely to have plans for their future career. CTE students more often than other students have participated in career planning activities and have specific job plans for the future. The exposure to specific career skills increased academic relevance, and achievement often motivates students to continue to postsecondary education. CTE program of study students tend to have more postsecondary and career aspirations than the non-CTE program of study students (Castellano et al., 2017; Hoachlander, 2008; Loera et al., 2013; Mobley, Sharp, Hammond, Withington, & Stipanovic, 2017; Stone, 2017). CTE programs of study provide students with “the assurance that knowledge and skills will provide a better preparatory foundation between secondary and postsecondary

education, and then into a high-skill, high wage, high-demand job opportunity such as engineering” (McCharen & High, 2010, p. 4).

The structure of career and technical education programs has an important impact on the success of the program and its students. A recent study by Thessin et al., (2017) identified four critical success factors for CTE program: “(1) learning environment and community, (2) focused student support, (3) engagement through a real-world context, and (4) a culture of professionalism” (p. 59).

Building an environment of support and community is a strong factor in the success of CTE programs. Teachers in these programs tend to build relationships with their students in the form of mentors working with rising professionals. In this type of environment, students build relationships among themselves more as co-workers through engagement and collaboration, which gives them a greater feeling of community (Thessin et al., 2018).

Student career interest is a major factor in student engagement and building a sense of community. Therefore, the placement of students in a CTE program that is of interest to them is important to their success. Students who are in programs with other students pursuing the same career field build strong relationships and a supportive, caring environment. These programs tend to have smaller class sizes, which leads to a culture of support and encouragement because teachers are better able to provide needed support (Thessin et al., 2018).

School and industry partnerships allow for collaboration in the development of a curriculum that addresses the identified career skills needed in particular fields of study, as well as employability skills needed in all fields. In addition to the development of curriculum, industry partners may also provide internship and apprenticeship opportunities where students can gain real-world, hands-on application of the knowledge and skills that are learned in the

classroom (Griggs, Kochan, & Reames, 2018; Thessin et al., 2018; Watters, Hay, Dempster, & Pillay, 2013).

According to a study by Griggs et al. (2018), school and industry partnerships provide students with a more in-depth look at the world of work. Students are allowed to learn and practice essential employability skills such as communication, networking, business etiquette, and professionalism. Students are better able to understand the relevance of what they are learning, as well as gaining a greater understanding of the workplace and its requirements and expectations. School and industry partnerships provide students with a greater comprehension of both work-related skills and personal skills required for entry-level positions and future growth.

Real-world settings, whether through work-based learning experiences or programs located within an industry setting, provide students with exposure to the realities of the workplace in their chosen career field (Griggs et al., 2018; Stipanovic et al., 2012; Thessin et al., 2018). This is accomplished through industry partnerships, which provide students the opportunity to learn in real-world facilities using real-world, state-of-the-art equipment. Teacher background is another aspect that contributes to the real-world environment. Many CTE teachers have themselves worked in the industry and bring valuable professional experience to the classroom (Thessin et al., 2018; Watters et al., 2013).

Traditional teachers usually gain theoretical knowledge through university courses taken (Watters et al., 2013). However, academic skills are embedded into the career and technical curriculum. CTE teachers with a background in the industry bring together “the theoretical embraided knowledge that students need, and the practical embodied and embedded knowledge acquired through the more traditional vocation education subjects” (Watters et al., 2013, p. 9).

The real-world work environment, teacher background experience, teacher/student relationship, high expectations, and collaboration contribute to the culture of professionalism in CTE programs. Many of these programs also incorporate real-world attire, which also brings a sense of professionalism to the classroom. Students in healthcare may wear scrubs or lab coats, students in a culinary program may wear chef's attire, while students in a construction program may wear hard hats and safety vests. This not only imparts a feeling of professionalism but also exposes the students to the realistic expectations of their chosen career field.

High-quality CTE programs are structured so that students gain insight into various careers, and the pathway needed to be successful in those careers. Through participation in high-quality career and technical education programs of study, students gain a better understanding of the abilities needed to be successful in postsecondary education. "Embedded in CTE programs are the support services necessary for students to pursue these rigorous courses and career opportunities, including mentors, career and technical student organizations, robotics, and other skill-based competitions, and work-based learning opportunities, such as job shadowing and internships, to connect youth with caring adult role models" (McCharen & High, 2010, p. 4).

According to Gentry et al. (2005), support systems such as counseling and at-risk intervention is critical to the success of CTE programs. Student needs must be addressed along with industry-aligned program standards. Providing students with the needed support and high-quality career technical programs helps them make the connection between school and their future career plans. Students in these programs are not only prepared for postsecondary education after high school but are also allowed to earn college credit while still in high school. College credits may be earned through articulation agreements between the local secondary education agency and the postsecondary education agency or dual enrollment.

Dual enrollment courses may be taught by college instructors or high school teachers who hold the necessary credentials for college courses on the high school campus or may be taught on the college campus during the regular school day or in the evening. Dual enrollment has become a strategy used to increase positive postsecondary outcomes for students that are traditionally underrepresented in higher education (Blankenberger, Lichtenberger, Witt, & Franklin, 2017; Gianni, Alexander, & Reyes, 2014; Karp & Hughes, 2008; Stringfield, Shumer, Stipanovic, & Murphy, 2013). “It appears that students’ likelihood of experiencing positive postsecondary outcomes increases for every dual-credit course they complete” (Giani et al., 2014, p. 211). According to a study by Blankenberger, et al. (2017), the likelihood of completing a 4-year degree increased with each semester, low-income students were enrolled in dual enrollment courses through a community college.

Exemplary career and technical education programs are often structured as an apprenticeship rather than as a traditional class. Curriculum and projects in an apprentice type program area are career-related and often provide students with postsecondary credit in addition to the high school credit earned. Students gain hands-on experience through career-relevant projects.

Gentry et al. (2005) identified distinct trends in an exemplary career technical center, which included professionalism, sense of community, and reason to learn. Training executed as an apprenticeship where students are treated as and act as professionals with the teacher as the master tradesman helps to create an atmosphere of professionalism. “With an apprentice, assessment is tied to performance and improvement is expected as the student acquires skills. . . tests covered performance skills and necessary knowledge in the career area” (Gentry et al., 2005, p. 59).

A sense of community is created through an environment of caring. In exemplary career and technical education programs, the learning environment provides students with opportunities to interact with peers, teachers, families, and the community (Gentry et al., 2005; Griggs et al., 2018). Students who perceive that teachers, administrators, and staff care about them personally are more likely to remain motivated to stay in school and to complete their program of study. Participation in program area-specific career technical student organizations (CTSO) further contributes to the sense of community through contact with industry professionals, competitions, and extended time outside the classroom, contributes to the feeling of professionalism. (Gentry, et al., 2005)

High-quality career and technical education programs can be found in schools where all requirements of programs of study are met. One of those requirements is the career technical student organizations (CTSO) for each program area offered. According to the study by Alfeld et al. (2006), positive outcomes for students is directly related to the student's level of participation in the CTSO. "Specifically, we found that the more students participated in CTSO activities, the higher their academic motivation, academic engagement, grades, career self-efficacy, college aspirations, and employability skills" (p. 145).

Students participating in CTSOs have the opportunity to gain knowledge and skills that can benefit them in whatever career they choose. Students are allowed to gain hands-on experiences that provide needed skills for any career field through competitive events. Local, state and national competitive events are a major component of CTSOs, which are often "run with the help of industry, trade associations, and labor organizations, and test competencies are set and judged by industry" (Alfeld et al., 2006, p. 123).

Rural Schools

Overview. According to NCES, in 2014-15 there were 98,180 public schools in the United States. Ninety-one thousand four hundred thirty of those were traditional public schools, and 6,750 were public charter schools. Eleven percent of charter schools were in rural areas, and 29 percent of traditional public schools were in rural areas. There are approximately 53 million students in the United States, with 20 percent of those students attending rural schools. Rural school districts in Alabama make up approximately 43.6 percent of all districts. Using the NCES code, 14.5 percent are (41) rural fringe, 19.6 percent are (42) rural distant, and 9.5 percent are (43) rural remote (ALSDE, 2018).

Many of these rural schools face barriers such as poverty due to the transient population of migrant workers and immigrant families. Financial hurdles due to decreased federal, state, and local funding is compounded by the migrant workers, immigrant families, and minority families living in poverty in rural areas (Biddle & Azano, 2016; Carter et al. 2009; Fishman, 2015; Horst & Martin, 2007). Poverty is a very real problem in many rural communities that also deal with increased drug usage, depression, and suicide among the youth in their communities. According to a study by Fishman (2015) drug usage is more likely among 8th-grade students in rural areas than in urban areas, and rural students are 59 percent more likely to use methamphetamines and 104 percent more likely to use any type of amphetamine. Suicide is twice as likely in rural youth between the ages of 10 and 24, and serious depression is 20 percent more likely in rural areas (Fishman, 2015).

Educational attainment and economic prosperity are directly related. This has proven to be true for rural areas when compared to urban areas. Wages in rural communities are consistently lower across all educational levels than in urban areas. Higher rates of poverty, child

poverty, unemployment, and decreasing population are seen in rural counties with lower educational attainment (Fishman, 2015; Gibbs, 2000; U. S. Department of Agriculture, 2017). Rural students' aspirations for postsecondary education are often influenced by the rural environment in which they live. "Eighty percent of rural residents live in counties where less than 15 percent of the adult population has a bachelor's degree" (Gibbs, 2000, p. 86).

The U.S. Department of Agriculture (2017) reported that in the 45 years from 1970 to 2015, the percentage of rural adults earning a high school diploma increased from 44 percent to 85 percent. Approximately one-third of rural adults hold a postsecondary degree. However, fewer adults in rural areas hold bachelor's degrees than in urban areas. During the period from 2000 to 2015, the number of rural adults earning a bachelor's degree increased from 15 percent to 19 percent while the number of urban adults earning a bachelor's degree increased from 26 percent to 33 percent. "This gap may be due to the higher pay offered in urban areas to workers with college degrees or the fact that some rural students choose to attend college and subsequently work in urban areas after graduation" (USDA, 2017, p.2). Another possible influence on this gap is that rural students often have decreased aspirations for postsecondary education due to the location of their community away from postsecondary institutions and a lack of financial resources for further education (Irvin et al., 2012).

In both urban and rural areas, earnings rise as the level of education rises. "In 2015, median earnings in rural areas were a fraction of those in urban areas for every level of education, with a larger earnings gap at higher levels of education" (USDA, 2017, p. 4). Urban employees holding a bachelor's degree earn approximately 20 percent more than rural employees with a bachelor's degree.

According to the USDA report (2017), 39 percent of Alabama counties have a poverty rate of 20 percent or higher. In 19 of 64 counties in Alabama, at least 20 percent of the population do not have a high school diploma (USDA, 2017). Fourteen percent of students in rural areas attend a high-poverty school. A high-poverty school is a school in which 75% of students are eligible for free or reduced-price lunch (USDE, 2017).

Challenges of Rural Schools. “It would be impossible to consider strategies for improving rural education without examining the pressing challenges of rural life” (Fishman, 2015, p. 9). Declining industry, expanding cultural differences with immigration from other areas of the world, and the transition of rural residents to more urban areas have brought about new challenges to rural schools. Economic globalization and declining population have led to a decline in jobs, decreased tax base, transiency, and increased poverty in rural areas (Biddle & Azano, 2016; Horst & Martin, 2007; USDA, 2017; Wilcox et al., 2014). High rates of child poverty and distance from larger cities also contribute to the challenges faced by rural school districts. The decline or stagnation of rural economies has influenced the transition of the brightest and best residents to more urban areas. Approximately 40% of rural residents who obtain college degrees either leave or do not return to their communities (Fishman, 2015).

Burdensome policies and a lack of resources are just two of the challenges faced by rural education. Policies such as Obama’s Race to the Top often harm rural school districts. State-mandated assessments, the push to prepare all students for college and career, accountability measures such as on-time graduation, and data-driven decision making to meet the needs of industry have increased the pressure on rural schools that are already often struggling with financial resources (Clark, Farmer, & Welch, 2010; Fishman, 2015; Wilcox et al., 2014). The small size of rural schools often makes benchmark testing scores vary significantly from year to

year (Horst & Martin, 2007). High-poverty rural schools are less likely to meet mandated requirements for student achievement than others.

The decreased tax base due to the economic decline in rural areas coupled with federal and state funding formulas that do not adequately provide for rural schools results in a lack of financial resources. This places rural education in a struggle to meet the needs of students, community, industry, and mandated accountability measures without adequate resources. (Carter et al., 2009; Fishman, 2015; Irvin et al., 2012; Lindahl, 2011; Wilcox et al., 2014). Faculty, staff, and administration often are required to hold multiple roles with little time for preparation and no additional compensation. Leaders in rural schools must rely on others to effectively meet the needs of students. While the responsibility of student achievement ultimately falls on the shoulders of the school leaders, sharing the burden with faculty, staff and community are essential for effectively meeting student needs (Masumoto & Brown-Welty, 2009; Wilcox et al., 2014).

Sparsity has a major impact on rural schools in varying areas of education, including transportation, curriculum, and teacher training, recruitment, and retention. Rural districts have increased transportation costs due to the long distances necessary to transport students before and after school. Rural schools often face transportation challenges due to the wide area of the student population that must be transported to school and back home each day. This increased transportation time due to distance traveled can harm student achievement due to sleep deprivation and decreased parental involvement (Lindahl, 2011, p. 2). Transportation for extracurricular activities such as sporting events can also be a major challenge due to the distance between schools within the same competition division (Williams & Nierengarten, 2011).

Recruitment and retention of qualified teachers is often difficult for rural school districts. “Rural districts often struggle to find even one qualified teacher per subject” (Fishman, 2015, p. 9). A shortage of teachers, especially teachers with advanced degrees, decreases the curriculum that can be taught, including Advanced Placement courses that would more adequately prepare students for postsecondary education (Biddle & Azano, 2016; Irvin et al., 2012). Teacher salaries tend to be lower in rural school districts, and fewer teachers hold advanced degrees and tend to be younger and have less experience (Gibbs, 2000).

Recruitment of high-quality teachers is an ongoing challenge for rural schools and is often compounded by the difficulty in providing professional development opportunities for teachers due to the distance from resources and financial constraints (Biddle & Azano, 2016; Fishman, 2015; Irvin et al., 2012). “Rural schools are challenged in all three areas of professional capital in terms of the ability to attract stronger talent than urban and suburban communities, to retain the best of that talent over time, and to conquer the tyranny of distance to build the social capital through which teachers can support and stimulate each other” (Hargreaves, Parsley, and Cox, 2015, p. 308).

Curricular challenges exist in many rural schools as they struggle “to offer options for students to pursue special interests, accelerated course work, or remedial course work” (Williams & Neirengarten, 2011, p. 16). These curricular challenges include career and technical education programs that can provide job-specific training needed in rural communities. With financial resources already strained in many rural school districts, career and technical education is often non-existent or very limited. The increased cost of operating many of the CTE programs due to the expensive equipment required is prohibitive for rural school districts already under financial constraints. State and local education agencies are often totally dependent upon Perkins funding

to implement high-quality career and technical education programs (Perkins Collaborative Resource Network, 2020).

In response to the stigma of traditional vocational education as a means for educating only the low income, minority students, and low achieving students, education became focused on college preparation for all students with little attention to skills needed for meaningful employment. However, rural students are less likely to continue to postsecondary education than the national average (Gibbs, 2000; Irvin et al., 2012; USDOE, 2014). Due to this focus on academics, graduation requirements, and college preparatory high school guidance counseling has become a challenge for career and technical education. According to the Pathways to Prosperity (Symonds et al., 2011), poor career counseling results in many students lacking information needed to make decisions that will enable them to successfully attain postsecondary credentials. This is especially true in rural schools where staff members often have multiple roles putting with little or no additional time, which further increases the gap (Wilcox et al., 2014).

Recruitment and retention of high-quality teachers in rural areas is already challenging and is even more so in career and technical education due to the requirement of specialized skills. CTE teachers with professional experience in the program area in which they teach hold a higher level of credibility with students than those who have earned certification through a traditional teacher education program. Teachers with an industry background rather than traditional certification background tend to manage their programs more like a workplace than a classroom and have a stronger connection to industry within the community. However, teachers with professional experience in a specific program are often difficult to recruit and retain due to the decrease in salary when moving from industry to the classroom (Biddle & Azano, 2016; Fishman, 2015; Thessin et al., 2018).

Many CTE teachers do not have any formal training as a teacher, and those who have earned traditional teacher certification have not been adequately trained on the integration of academics and career technical education content. High-quality CTE programs also require intensive on-going professional development for teachers to gain the skills needed for contextualized learning instruction. If students are to be truly college and career ready, CTE teachers must be properly trained to provide the integrated contextual learning instruction necessary for students to be prepared for whatever pathway they may choose (Park et al., 2017). Recruitment and the professional development of high-quality CTE teachers is an ongoing challenge for rural schools due to the distance from resources and financial constraints. The need for teacher resources, curricula, and professional development is a challenge in the implementation of high-quality education (Biddle & Azano, 2016; Clark et al., 2010; Fishman, 2015).

Students in rural schools are less likely to be college and career ready than their urban counterparts (Gibbs, 2000). Both college readiness and career readiness require many of the same skills necessary for success. According to Conley (2012), there are four keys to being college and career ready: key Cognitive Strategies, Key Content Knowledge, Key Learning Skills and Techniques, and Key Transition Knowledge and Skills. Conley's Key Transition and Knowledge Skills include knowing which courses to take in high school, as well as knowing the processes to smoothly transition to postsecondary education, including the expectations of college and the workforce. The knowledge and the skills needed to be both college and career-ready are often associated with counseling services in high schools. However, staffing issues in rural schools include "limited counseling services that provide information about postsecondary education opportunities and arrange campus visits" (Irvin et al., 2012, p. 74). High school

counseling has historically been a challenge for career technical education due to the focus on academics, graduation rate, and college preparation, and the limited resources in rural schools only compound the problem.

High-quality career and technical education programs include the integration of academics and career technical knowledge and skills. Career and technical education pathways provide contextualized learning, mentoring, and work-based learning, as well as the possibility to earn postsecondary credits (Stipanovic et al., 2012; USDE, 2012; Watters et al., 2013). However, economic globalization and declining population which have led to a decline in business in rural communities present a challenge for career and technical education through the lack of or limited numbers of employers in rural areas for job shadowing, internships, and work-based learning (ACTE, 2015; Wilcox et al., 2014).

Characteristics of Exemplary Rural Schools. Despite the many challenges faced by rural school districts in the United States, many of those districts have high performing schools. These high achieving rural schools often share some common characteristics, such as high goals and expectations (Thessin et al. 2018; Wilcox et al., 2014). According to Wilcox et al. (2014) high achieving rural schools have high goals and expectations for all students to succeed in and beyond their secondary education. “Exemplary career and technical education programs in rural areas provide rigorous and relevant career pathways that engage students in planning for their futures, develop their academic, technical, and employability skills, and provide opportunities for work-based learning and mentorship, all delivered flexibly through different school formats as well as online learning” (USDOE, 2014, p. 1).

High performing rural schools also have a culture of collaboration. Faculty and staff in these schools realize the importance of shared responsibility in meeting the needs of all students.

This shared responsibility may include faculty and staff members serving in multiple roles to provide the support and learning opportunities essential for student success. In the study by Wilcox et al. (2014), the administrators “in high performing schools described adjusting staffing arrangements collaboratively and in ways that seemed to match roles to educators’ skills and experience” (p. 9). Faculty, administrators, counselors, and staff work together to monitor student progress and implement strategies, including supplemental instruction, to ensure the success of all students.

Collaboration in high performing rural schools extends beyond the walls of the classroom and even beyond the walls of the school itself. Successful rural schools understand the importance of collaboration between school, business/industry, community, and postsecondary education. This includes incorporating outside resources such as business and industry partners for professional development, funding, job shadowing, internships, and work-based learning opportunities for students (Watters et al., 2013; Wilcox et al., 2014). Partnering with postsecondary education to provide articulated credit and dual enrollment credit increases student self-assurance for being successful in college (Karp & Hughes, 2008; Stringfield et al., 2013; Wilcox et al., 2014). Collaboration across districts in order to “share knowledge and experiences and develop their improvement capacities” (Wilcox et al., 2014, p. 8) is also seen in high performing rural schools.

Small rural schools and communities have the opportunities to develop relationships between staff, students, and the community that create a small, family atmosphere that is conducive to learning. Staff and faculty living within the school community help to build these relationships and trust between the school, parents, and community (Hargreaves et al., 2015; Horst & Martin, 2007; Masumoto & Brown-Welty, 2009).

Although curricular challenges exist in many rural schools, high achieving schools confront those challenges with the mindset of success for all students. Seeing beyond state mandates (passing state assessments and graduating on-time) and thinking long-term to success after high school either in post-secondary education or the workforce is a key element of successful rural schools. Individual and collective efficacy is seen in these high performing rural schools where teachers are encouraged to try new and innovative ways to help students reach the goals of high school graduation and success beyond high school (Stringfield et al., 2013; Thessin et al., 2018; Wilcox et al., 2014). Rural schools often have lower teacher-student ratios; teachers have more autonomy and indicate greater satisfaction with their work environment (Gibbs, 2000).

In rural communities, the school is often the social center. Being the center around which the community revolves can be an asset for rural schools (Hargreaves et al., 2015; Lindahl, 2011; Masamoto & Brown-Welty, 2009 Wilcox et al., 2014). These schools often enjoy “strong parental involvement, close ties to churches, and partnerships with business and the broader community” (Hargreaves et al., 2015, p. 307). Rural communities in which the school is the center also tend to place a higher value on education and have increased trust in the school and its staff (Horst & Martin, 2007; Masamoto & Brown-Welty, 2009).

Many rural school districts have experienced an increase of students in need of special education services. High-quality career and technical education programs that provide rigorous, relevant career pathways for all students is part of the services offered for these students. Students with disabilities who take a concentration of career and technical education courses are more likely to have positive education and employment outcomes than those that do not take a concentration of CTE courses. Students with disabilities who take a concentration of CTE

courses have shown fewer absences, more likely to be on track for graduation, and to be employed after high school (Theobald, Goldhaber, Gratz, & Holden, 2017, p. 31). Theobald et al. (2017) found “consistent evidence that CTE enrollment is positively predictive of on-time graduation; specifically, students with disabilities who participate in CTE courses in 12th grade are approximately three percentage points more likely to graduate at the end of the year than students with disabilities who do not participate, all else equal” (p. 29).

High performing career and technical education programs in rural Alabama schools include the integration of academics and career technical knowledge and skills for high demand, high wage jobs. Students are gaining skills that prepare them for postsecondary education, employment, apprenticeships, and the military. Many of these students are earning industry-recognized credentials necessary for employment before leaving high school. “Exemplary career and technical education programs in rural areas provide rigorous and relevant career pathways that engage students in planning for their futures, develop their academic, technical, and employability skills, and provide opportunities for work-based learning and mentorship. . . .” (ACTE, 2015, p. 1).

Summary

For more than 150 years, career and technical education has been a part of the United States education system. Career technical education began as vocational education with a specific occupational focus at the college level in 1862. Vocational education continued to be a part of post-secondary education while also moving into secondary education through government funding in 1917. Following World War II integration of academics and vocational education began to increase, which led to the Carl D. Perkins Act, which provides funding so

that students can be prepared for both college and career. The integration of academics and vocational education led to changing the name to career and technical education.

The education pendulum has swung back and forth from preparing students for classical academic education to preparing for specific occupations then back to an academic focus to prepare all students for college; however, efforts are now being made to prepare students for both college and career (Castellano et al., 2017; Hoachlander, 2008; McCharen & High, 2010; Stringfield & Stone, 2017). The U. S. labor market has changed over the past forty years so that there is an increasing number of jobs requiring some type of postsecondary training or education, causing employers to be lacking in skilled workers. High-quality CTE programs are sources for employers to fill these employment gaps and their needs for skilled workers (Castellano et al., 2012; Hoachlander, 2008; Stone, 2017; Stringfield & Stone, 2017; USDE, 2012).

Many of the requirements for entry-level positions listed in the Occupational Outlook Handbook (OOH) with a median wage of \$35,000 per year can be obtained through high school career technical education programs (Stringfield & Stone, 2017). CTE programs provide students the opportunity to earn certifications or stackable credentials which will qualify them for many of these jobs or provide the foundation for an easier transition to postsecondary education (Castellano et al., 2017; Hoachlander, 2008; Stipanovic et al., 2012; Stringfield & Stone, 2017; Stringfield et al., 2013).

The level of education attained by residents of a community is directly related to economic prosperity. Rural counties in which residents have attained a lower level of education also tend to have increased rates of poverty, child poverty, unemployment, and decreased population (USDA, 2017). Counties in which less than 15 percent of the adult population hold a bachelor's degree make up 80 percent of the rural population (Gibbs, 2000; USDA, 2017). Rural

students often have decreased aspirations for postsecondary education due to the environment in which they live (ACTE, 2015; Irvin et al., 2012).

Approximately 20 percent of the 53 million students in the United States attend a rural school, with 30 percent of Alabama students attending rural schools (Carter et al., 2009; Fishman, 2015). Many of the rural communities in which these schools are located have high rates of poverty due to increased global economics and declining population leading to a decline in jobs and a decreased tax base, and the transient population of migrant and immigrant workers (Horst & Martin, 2007; Wilcox et al., 2014). The decline in job opportunities in rural areas has further exacerbated the issue of a declining population due to many of the best and brightest residents moving to urban areas to find jobs (Biddle & Azano, 2016; Fishman, 2015; Wilcox et al., 2014).

Career and technical education offer opportunities to increase the educational attainment of rural students through dual enrollment. A study by Karp and Hughes (2008) found slightly higher grade point averages, increased instances of earning a high school diploma, and increased likelihood of continuing postsecondary education for students who took dual enrollment courses. With the increase in technology and distance learning, the opportunities for rural students to enroll in dual credit courses have also increased. Low-income students are more likely to earn a bachelor's degree with each semester they are enrolled in dual credit courses. (Blankenberger et al., 2017)

Rural school districts and career technical education both face many challenges, including financial hardships, recruitment and retention of teachers, and state and federal mandates that are difficult to meet. With increasing focus on preparing all students to be both college and career ready, there has been a great deal of research completed on improving rural

schools and on the benefits of career and technical education; however, there is little research on exemplary career and technical education in rural school districts. Therefore this study sought to identify key characteristics of exemplary career and technical education programs in rural schools.

Chapter III: Methods

Many rural areas are caught in a vicious cycle of poverty, high dropout rates, declining population due to the more educated residents transitioning to urban areas for employment, and economic globalization. Economic globalization and declining population have led to a decline in jobs, decreased tax base, transiency, and increased poverty in rural areas. (Wilcox et al. 2014) Rural schools face financial hardships due to the lack of a qualified workforce, loss of jobs, and a narrow economy (Carter et al., 2009). Providing a skilled workforce is necessary to draw industry and create jobs in rural areas.

Workforce needs have changed so that the skills needed to be successful in the current and future labor market have changed. Career and technical education is a means for providing students with the knowledge and skills needed to be successful in the labor market. CTE provides the skill and knowledge necessary for a skilled workforce to be globally competitive. There has been little research done to identify the key characteristics of exemplary career and technical education programs in rural areas. This research study will add to the limited literature on the subject of career technical education in rural areas. This researcher sought to gain an understanding of the development and implementation of exemplary rural career and technical education programs. Identification and understanding of these key characteristics should be of value to education administrators in rural areas seeking to improve student achievement and provide students the opportunity to gain the skills necessary to be successful in both college and the workforce through career and technical education.

Purpose of the Study

The purpose of this study was to use the criteria for the Advance CTE Excellence in Action Award (2019) to examine CTE programs in rural areas that have been identified as

exemplary and how the identified elements were implemented in the program. Rural schools face many challenges, including increased drop-out rates, economic hardship, declining population, and students inadequately prepared for college or career. The increase in skill requirement for a qualified workforce has also placed new challenges on rural school districts. The integration of academics, technical skills, and employability skills in exemplary career and technical education programs provides students with the skills required in order to fill the workforce needs. In order to add to the limited literature, the researcher interviewed career technical directors and career technical teachers in rural CTE programs that have been identified as exemplary by the Alabama State Department of Education in order to identify key elements of these programs.

Participants

Reputational sampling was employed as a research strategy to select the career technical education programs to be studied. A multi-step process was used to identify exemplary career and technical education programs in rural-fringe, rural-distant, and rural-remote settings in Alabama. Yin (2018) suggests that identification of cases to be studied may include the input of people with knowledge about each of the possible participants. After narrowing the possible participant pool, both Yin (2018) and Stake (1995) recommend choosing those that will provide the greatest understanding of the topic, as well as ease of access, availability of data sources, and their willingness to participate in the study.

The National Center for Educational Statistics has identified all rural schools with a locale code of (41) rural-fringe, (42) rural-distant, or (43) rural-remote. The researcher identified twenty-six (26) rural fringe school districts, thirty-five (35) rural distant school districts, and seventeen (17) rural remote school districts in Alabama.

Following the identification of the rural school districts in Alabama, the researcher contacted the Assistant Superintendent of Education for Career Technical Education and

Workforce Development at the Alabama State Department of Education for input in nominating exemplary programs in these school districts. The Assistant Superintendent forwarded the researcher's request to the Senior Director for Workforce Development at the Alabama State Department of Education. Until the beginning of the 2019-20 school year, career technical education programs in Alabama used a Business Industry Certification process, which measures compliance, but Alabama did not have a program evaluation system in place. Therefore, the researcher provided the Advance CTE's (2019) criteria for exemplary career and technical education programs, which was used for this study's conceptual framework and the list of identified rural school districts to the senior director. The senior director's knowledge of the programs has been gained through his frequent interaction and observation of best practices within the career technical programs in each Alabama school district.

The senior director nominated five school districts as having exemplary career technical education programs: two rural fringe, two rural distant, and one rural remote. To increase the validity of the study, the researcher then contacted the former Alabama Assistant Superintendent of Education for Career Technical Education and Workforce Development for the corroboration of the exemplary career technical programs that had previously been nominated. After receiving the list of rural schools and Advance CTE (2019) criteria for exemplary career and technical education programs, he reviewed the list of rural schools and confirmed the schools previously nominated, as well as nominating four additional schools. A total of nine school districts were nominated: four rural-fringe, three rural-distant, and two rural-remote. The following Advance CTE (2019) criteria for exemplary career and technical programs was used to review and nominate exemplary programs:

- 1) Implementing Career Cluster®-based programs of study.

- 2) Maintaining effective employer and business partnerships.
- 3) Demonstrating alignment to rigorous and relevant college- and career-ready expectations.
- 4) Demonstrating a clear progression of knowledge and skills and student transitions across secondary and postsecondary systems.
- 5) Integrating successful career guidance and advisement.
- 6) Integrating high-quality work-based learning experiences.
- 7) Highlighting alignment to workforce and employer needs in the community; and
- 8) Providing concrete data on the program of study's impact on student achievement and success at both the secondary and postsecondary levels. (USDOE, 2014)

The superintendent and career technical directors for each of the school districts were contacted by email to request their participation in the study. In addition to requesting their participation, the email also explained the purpose of the study and why their school district was chosen as a potential participant.

Once each school district agreed to participate, the career technical director then nominated one program from their career technical center to participate in the study. The instructor for that program was contacted by email to request their participation with a follow-up phone call to finalize the agreement for participation and schedule a time and place for the interviews and classroom observations. Of the nine school districts nominated for the study, six of them agreed to participate. Table 1 depicts the participants' demographic data.

Table 1

Participant Demographic Data

Rural Classification	Position Held	Gender
Rural Fringe	CTE Director	Female
Rural Fringe	Teacher	Female
Rural Fringe	CTE Director	Male
Rural Fringe	Teacher	Female
Rural Fringe	CTE Director	Male
Rural Fringe	Teacher	Female
Rural Distant	CTE Director	Male
Rural Distant	Teacher	Male
Rural Distant	CTE Director	Male
Rural Distant	Teacher	Female
Rural Remote	CTE Director	Female
Rural Remote	Teacher	Female

Researcher Positionality

The researcher is a doctoral student pursuing a Ph.D. in Administration of Elementary and Secondary Education. The researcher has twenty-one years of experience in career and technical education. Of those twenty-one years, twelve years were as a full-time career technical teacher, eight years as a half-time career technical teacher and half-time career technical director in two different school districts. One year the researcher served as a full-time career technical director. The researcher’s primary role was to study exemplary career technical education programs in rural school systems to examine the key elements of those programs.

Research Design

This study used a qualitative approach to gain a better understanding of the key elements of exemplary career and technical education programs in rural areas. According to Yin (2018), qualitative methods are used to gain an in-depth understanding of a phenomenon within its real-world context, when the researcher has little or no control over behavior, and the case is bounded.

This study used a descriptive case study design in order to give an in-depth insight into what elements were present in exemplary, rural career and technical education programs and how they were implemented. Descriptive case study was chosen because the researcher wanted to provide a rich illustration of exemplary career technical education programs through the eyes of key stakeholders. A constructivist approach was utilized in “an attempt to capture the perspectives of different participants” (Yin, 2018, p. 16).

Research Questions

The study addressed four questions:

1. Are the elements used as criteria for the Advance CTE Excellence in Action Award evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
2. Are there additional elements evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
3. How do the participants perceive the benefits of exemplary career and technical education programs in rural fringe, distant, and remote settings?
4. What are the challenges of career and technical education programs in rural, fringe, distant, and remote settings as perceived by the participants?

Data Collection

According to Yin (2018), there are six sources of evidence that can be collected in a qualitative research study, including: “documentation, archival records, interviews, direct observations, participant-observation, and physical artifacts” (p. 111). Data collection was drawn from multiple sources for this descriptive case study and included data collected primarily from (1) interviews with key stakeholders including career technical directors and career technical

program teachers; (2) field observations of students, teachers, and administrators in the identified programs; (3) archival data such as career readiness indicator reports, core indicator reports, and student placement reports.

The researcher submitted written requests for career readiness indicator reports, core indicator reports, and student placement reports to the career technical education director for each school system in the study.

Interviews. Interviews are often used to gain insight into the perceptions of the participants. “Case study interviews will resemble guided conversations” (Yin, 2018, p. 118); therefore, semi-structured interviews were used to ascertain the career technical administrators’ and teachers’ perceptions of the key elements of exemplary programs and their implementation.

The researcher developed fourteen interview questions that were used to guide the interview process. Additional questions were asked for clarification, to gather more in-depth information, and to explore the perceptions of the participants further. Interview questions were designed to obtain information about the participants' perspective of the elements of exemplary career technical education programs and how they are implemented.

The interviews were held at a time and place chosen by the participant. The researcher recorded each interview, and all information was held confidential. All interviews were transcribed verbatim and pseudonyms used to protect the identity of the participants. Interview recording and transcriptions were stored on a password-protected site and destroyed once the study was completed.

Observations. Observations and field notes provide “invaluable data to complement interviews” (Yin, 2018, p. 122). Descriptive fieldnotes present a detailed record of what is

observed while field notes were taken during an interview to capture what the recording cannot capture, such as body language, expressions, and environment (Bogdan & Biklen, 2007).

Observations of students and teachers in the classroom were made to gain insight into the implementation of high-quality career technical education programs. The observations provided a rich description of the setting, as well as the relevant behaviors of both students and teachers.

Documentation. “For case study research, the most important use of documentation is to corroborate and augment evidence from other sources” (Yin, 2018, p. 115). For this research study, student career-readiness indicator records, core indicator reports, student placement reports, and photographs were examined. These documents were used to provide evidence that was either confirming or contrary to that from other sources. Written requests for student credentialing records and core indicator reports were submitted to the superintendent or career technical education director for each school system in the study.

Data Analysis

Bogdan and Biklen (2007) define data analysis as “the process of systematically searching and arranging the interview transcripts, field notes, and other materials you accumulate to enable you to come up with findings.” Creswell (2007) stated that data analysis begins with the preparation and organization of data, which is then reduced through coding. Developing a coding system is crucial in data analysis and involves identifying patterns and topics with words or phrases to represent them (Bogdan & Biklen, 2007).

The researcher read through the data multiple times, with the researcher making marginal notes and initial codes. Initial coding (open coding) may include various selected coding methods and is the first cycle open-ended approach used to identify concepts that were then combined into broader themes (Creswell, 2007; Saldana, 2013). During initial coding, the

researcher employed the use of exact quotes, processes, and words or phrases to identify the topic of select passages. Sub-coding was then used to provide more detail to broad primary codes (Saldana, 2013). The researcher kept a running list of codes that were categorized using focused coding to identify themes. Categories and themes were then aligned to the research questions.

Finally, the researcher triangulated the data collected from multiple sources, which included college and career-ready reports, core indicator reports, student placement reports, and equipment and facilities photographs. Triangulation of data is used to develop the convergence of evidence, which increases the likelihood of accurate findings. Multiple data sources were used in order to establish validity and reliability in this case study. “By developing convergent evidence, data triangulation helps to strengthen the construct validity of your case study. The multiple sources of evidence essentially provide multiple measures of the same phenomenon” (Yin, 2018, 128).

Limitations

1. The study only included rural career and technical education programs in one state.
2. The study only included programs in career and technical education centers.

Assumptions

1. Participants provided accurate and truthful answers in interviews.
2. Career technical directors and teachers at each school were willing to participate in the study.

Summary

Chapter 3 presented an overview of the methodology used for this descriptive case study. This chapter discussed the research design, participant selection, data collection, and data analysis design. Data collection included (1) interviews with key stakeholders including school

administrators, career technical directors, and career technical program teachers; (2) field observations of students, teachers, and administrators in the identified programs; (3) archival data such as career readiness indicator reports, core indicator reports, and student placement reports; (4) curriculum documents and continuous improvement plans.

The interviews were transcribed, and all data were coded to identify concepts that were combined into broader themes (Creswell, 2007; Saldana, 2013). The researcher then triangulated the data collected from multiple sources to develop the convergence of evidence.

Chapter IV: Results

Purpose of the Study

The increased demand for a skilled workforce has placed new challenges on rural school districts. Students are provided the opportunity to obtain the skills required to fill the workforce needs through exemplary career and technical education programs. The purpose of this study was to identify key characteristics of exemplary career and technical education programs in rural areas using the criteria for the Advance CTE Excellence in Action Award (2019) as the basis for the study. In order to add to the limited literature, the researcher interviewed career technical directors and career technical teachers in rural CTE programs that have been identified as exemplary by the Alabama State Department of Education in order to identify key characteristics of these programs.

Research Questions

The study addressed four questions:

1. Are the elements used as criteria for the Advance CTE Excellence in Action Award evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
2. Are there additional elements evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
3. How do the participants perceive the benefits of exemplary career and technical education programs in rural fringe, distant, and remote settings?
4. What are the challenges of career and technical education programs in rural, fringe, distant, and remote settings as perceived by the participants?

Methodology

This study used a qualitative approach to gain a better understanding of the key elements of exemplary career and technical education programs in rural areas. The researcher used a descriptive case study design to provide a rich illustration of exemplary career technical education programs through the eyes of key stakeholders.

Data collection. Data collection was drawn from (1) interviews with key stakeholders including career technical directors and career technical program teachers; (2) field observations of students, teachers, and administrators in the identified programs; (3) archival data such as career readiness indicator reports, core indicator reports, and student placement reports from six career technical education centers in rural Alabama. Three of the career technical education centers were classified as rural fringe, two were classified as rural distant, and one was classified as rural remote.

Data analysis. Initial coding was used for a first-level analysis of the data collected in this study. The initial coding process allowed the researcher to identify concepts across the data from all six schools. The researcher kept a running list of codes that were categorized using focused coding to identify themes. Color coding was then used to align categories and themes to the research questions. To increase the likelihood of accurate findings through the convergence of evidence, the researcher triangulated the data collected from multiple sources, which included career readiness reports, core indicator reports, student placement reports, and equipment and facilities photographs.

Research Findings

Research question 1. The first research questions asked, “Are the elements used as criteria for the Advance CTE Excellence in Action Award (2019) evident in exemplary career

and technical education programs in rural fringe, distant, and remote settings” During the research investigation and data analysis, various elements were identified and then organized into four categories of elements in answer to research question 1. These categories were: 1) Partnerships, 2) College and Career Readiness, 3) Real World Environment, and 4) Program Characteristics. Each category is discussed in detail in the following sections.

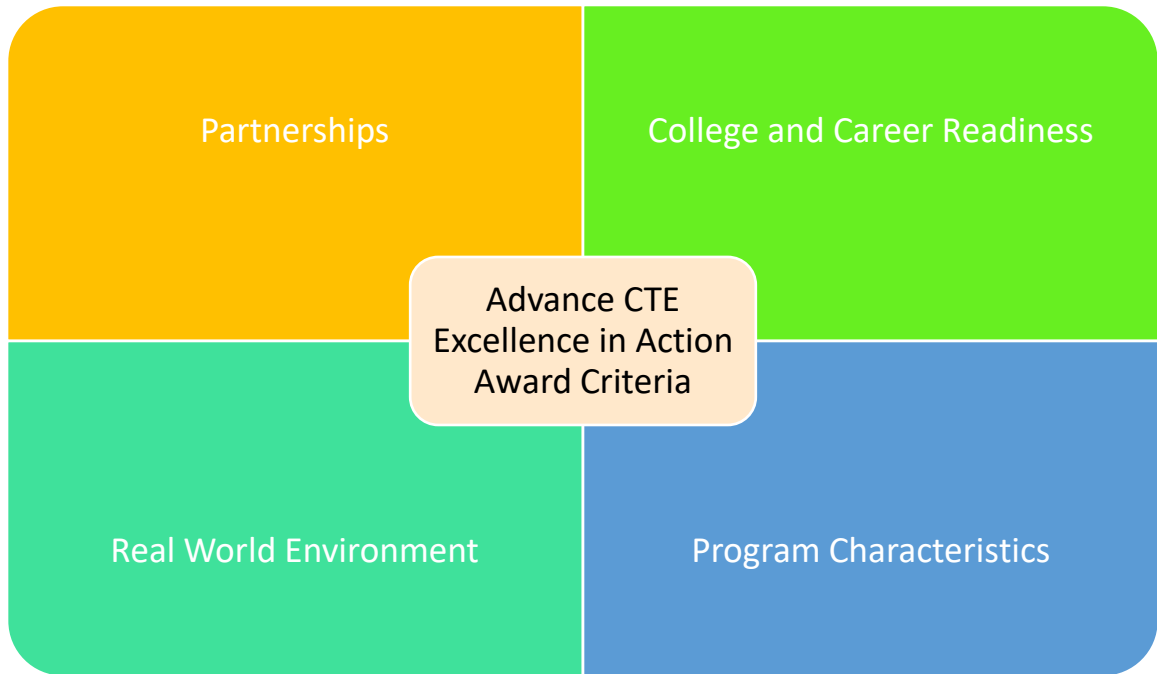


Figure 1. Categories of Elements Present in Advance CTE Excellence in Action Award (2019)

Category 1: Partnerships. The data collected from both career-technical director and career technical teacher interviews revealed that most participants repeatedly identified partnerships as an important element in exemplary career technical education programs. According to participants, these partnerships were held with three groups of stakeholders: 1) Industry partners; 2) Education partners; and 3) Community/Parent partners.

Industry partners. The framework developed by the U.S. Department of Education (2012) to guide the design of career technical education programs of the study identified industry partnerships as sources for workforce development and labor market data, identification of skills

and assessments currently needed in the workforce. According to a study by Griggs et al. (2018), school and industry partnerships provide students with a more in-depth look at the world of work. Eleven out of twelve interview participants talked about the importance of industry partnerships. Director Two said,

Partnerships are probably one of the most vital roles in my job – Industrial development boards, the workforce development boards – Staying in constant contact with different businesses and industries. Knowing what the workforce needs are of your particular area and making sure that we’re offering the right programs that fill their needs.

Another example was Director Five’s statement, “Number one is meeting the needs of business and industry. If they are not beating our door down wanting the students in that program, then that program should not exist.” Director Four also commented,

. . . that’s one of my top priorities for this; if not this school year, then this coming up the school year, is strengthening our relationships with our industry partners and advisory committee. I want them to be providing input on, you know, what courses we’re teaching, what are we doing, what credentials are we giving.

The career technical teachers also noted the importance of these industry partnerships. Teacher Two said, “I’m in constant contact with industry, with my industry advisory committee members.” In her interview, Teacher Three agreed, “I think the business industry part as far as having real live work people in that is. . . that’s what’s crucial. That’s gonna make or break your program.” Later in the interview, she explained, “That advisory thing still is critically important because they’re the ones in the trenches. They’re the ones doing it and knowing what works and what doesn’t work with the economy that’s changing.”

Although eleven out of twelve participants identified industry partnerships as an important element in high-quality career and technical education, there were some differences across rural fringe, distant, and remote areas. Participants in rural fringe and rural-distant areas spoke of more often about industry involvement than did participants in rural-remote areas. Rural-fringe and distant participants discussed multiple industry partners assisting with interviewing students, financial support, providing internships, guidance for program needs, and assisting in the classroom. Rural-remote participants discussed less industry involvement and addressed the difficulty in partnering with industry to provide internships due to the distance from the school to the industry. Rural-remote participants discussed industry partners providing financial support and serving in an advisory capacity but did not discuss industry partners assisting in the classroom or with student interviews.

Education partners. Partnerships with education include support for programs from administrators at all school levels, as well as the board of education. CTE Director Two identified school-level administrators and central office administrators as important when he stated,

Our principals at our high schools have bought in, and they see what they are doing matters in the lives of their students, and I could not do it without their support and the central office support allowing us to do the schedule.

When talking about the school level administrators at the career technical center where she teaches, Teacher Five stated, “We have great leadership. . . they are definitely involved. They know what’s going on in our program. . . They’re very involved and helpful and definitely supportive.” Teacher Two corroborated the belief that school-level administrator support is

important when he stated, “You’d have to have . . . a school principal that backs that teacher up with that program and helps them get those necessary things they need to make it high quality.”

The importance of higher-level administrative support, including district level and state level administration was seen in Director One’s statement, “. . . you’ve gotta have your central office and state department.”

The need for partnerships between secondary and postsecondary educational institutions was another area identified in the framework developed by the U.S. Department of Education (2012). According to the Association for Career and Technical Education (2014) CTE “features high school and postsecondary partnerships enabling clear pathways to certifications and degrees.” These partnerships have been developed through articulation agreements and dual enrollment programs. Director Six gave evidence of this when she said, “All of our class are dual enrollment.” Teacher Four discussed both dual enrollment and articulation. She stated, “In welding, we have six students who are going to graduate with their college short certificate two weeks before they get their high school diploma.” She spoke further to partnerships with postsecondary institutions through articulation in her statement,

So the reason we structured our program like this is because the state has an agreement with Sanborn University that if you take foundations, teaching one and teaching two and make an A or B in it, then they’ll give you credit for introduction to foundations of education if you go to Sanborn.

Teacher Five also indicated a partnership with postsecondary education when she stated, “They get a whole additional college credit if I have child development on top of my teaching and training course.”

All participants in this study identified education partners as important. However, rural-remote participants did not discuss school and district level education partnerships but did identify partnerships with postsecondary education as important.

Community partners. When asked about the elements believed to be crucial to a high-quality career technical education program, Teacher Four identified stakeholder support as a vital element. She explained, “We have really good community support . . . like Senator Bennett went around to every when Dr. Russell was recruiting, he went, he spoke at every one of those sessions to all of the 10th graders.” She also added, “So having that community buy-in makes a huge difference as far as how everything plays out.” Teacher One also identified community stakeholders as major contributing factors to quality career and technical education. She further stated, “Well, we include students, parents, and then especially in our field the people in the community.”

While both rural fringe and rural-remote participants identified community partners as crucial elements to high-quality career and technical education, rural-distant participants only discussed financial assistance from industry partners within the community.

Category 2: College and career readiness. All of the participants expressed the importance of preparing students for both college and career during the interviews. The following quotes are representative of participants’ belief that career and technical education prepares students to be college and career ready.

- “I feel like what I am doing is developing teachers.” (Teacher One Transcript, Line 9).

- “. . . that’s the ultimate goal that we prepare our students to be college and career ready. And if they’re able to take their skills, take their credentials and move on to that next level, then I think that’s a success.” (Director One Transcript, Lines 62-63).
- “We’re preparing them for life.” (Director Five Transcript, Line 377).
- “If it’s a certification or credit or anything, I think that’s super beneficial and one of the most important things about a very high-quality program if they’re actually certifying them and actually preparing them for the real world outside of 12th grade.” (Teacher Five Transcript, Lines 16-18).
- “. . . if we put students out that are entry-level ready for either work or if they choose to go into the college field.” (Teacher Six Transcript, Lines 15-16).

According to participants in this study, college and career readiness include earning industry-recognized certifications. Students can earn certifications or stackable credentials in high school career technical programs, which will qualify them for jobs and provide the foundation for an easier transition to postsecondary school or more advanced jobs. Teacher Two said, “I gear like this year real heavy toward Photoshop certification and year three toward Adobe certification in general.” Another example was when Director Three stated, “. . . and high-quality career technical education can leave kids with credentials, with skills they can use.” This was also indicated by Director Five’s statement, “High-quality programs. Relevancy. Getting those industry-recognized credentials and certifications.”

Earning college credit through dual enrollment or articulation was also recognized by participants as college and career readiness. When discussing college and career readiness, Director Four explained, “In welding, we have six students who are going to graduate with the college short certificate two weeks before they get their high school diploma.” Director Six also

addressed dual enrollment when she stated, “All of our classes are dual enrollment . . . Our drafting they end up with a short certificate . . . Our CNA program, they end up with a short certificate as well.” An example of earning articulation credit was when Teacher One said, “She was only a freshman last year, and she was already in the College of Education cause she had already met her prerequisite hours.” Teacher Five also stated, “They get a whole additional college credit if I have child development on top of my teaching and training course.”

Articulation credit was also explained in Teacher Four’s statement,

So the reason we structured our program like this is because the state has an agreement with Sanborn University that if you take foundations, teaching 1, and teaching 2, and make an “A” or “B” in it, then they’ll give you credit for Introduction to Foundations of Education if you go to Sanborn.

Although all participants expressed the importance of preparing students for both college and career, rural fringe and rural-distant participants were more focused on students preparing to go to either college or into the workforce while rural-remote participants were more focused on preparing the student for the workforce. All participants discussed offering students the opportunity to earn college credit through either dual enrollment courses or articulation credit for high school courses.

Category 3: Real-world environment. Career and technical education pathways provide contextualized learning, mentoring, and work-based learning. . . (Stipanovic et al., 2012). This conceptualized learning takes place by providing students with hands-on, work-based learning opportunities in a real-world environment. This real-world environment includes accountability, the development of soft skills, and job-related skills in a setting that, as closely as possible, resembles the real-world workplace. Eleven out of twelve (92 %) participants in this study

identified the simulated workplace as an important factor in the quality of the career and technical education programs. Only one rural-remote participant did not identify the simulated workplace as an important factor, although it is implemented within her school. The following are examples of the importance of a real-world environment,

- “I consider anything done around the simulated workplace to be high quality . . . they’re getting a glimpse of what they would see in their professional life.” (Director One Transcript, Lines 35, 37).
- “It has to be hands-on work-simulated. It has to be . . . It’s theory based but hand-on they remember.” (Teacher One Transcript, Lines 42, 44).
- “We were already simulated workplace, you know. They’ve got a clock in system now, but this is like a composing room. This is like a design composing room.” (Teacher Two Transcript, Lines 301-302).
- “I think probably the best thing that I’ve come across is when Dr. Cleveland pushed out the simulated workplace because no matter what you do in life, that, that can impact you.” (Director Three Transcript, Lines 13-15).
- “The greatest part of the simulated workplace classroom is the accountability of students.” (Teacher Three Transcript, Line 95).
- “High-quality technical education to me I think . . . they’re participating in hands-on activity not just in the classroom, in theory, all the time.” (Director Four Transcript, Lines 16-18).
- “I think it needs to be based on hands-on, real-life work scenarios for students to understand the benefit, the impact, and the significance of what they’re doing.” (Teacher Four Transcript, Lines 136-137).

- “It’s simulated workplace, so the students generate their work orders, they communicate with the public; they do live work. Each shop has a business name every year. They have team meetings.” (Director Five Transcript, Lines 232-234).
- “As administrators, we hear the word culture a lot. Culture at a career tech center is a little bit different cause we’re striving to . . . mirror the culture of the workplace.” (Director Five Transcript, Lines 308-310).
- “I think that does help with high quality because they’re seeing the real world . . . That’s what simulated workplace does for us.” (Teacher Five Transcript, Lines 116-121)
- “First and foremost, teaching soft skills to students.” (Teacher Six Transcript, Line 30).

Category 4: Program characteristics. Merriam Webster (2020) defines the word characteristic as “a distinguishing trait, quality, or property.” Participants in this study identified characteristics of high-quality career and technical education programs. While some of these characteristics provide an answer to research question one, some of them will be discussed later in answer to question two.

Implementation of programs of study. High school career technical programs of study are structured in a sequence of three or four increasingly rigorous courses that may include work-based learning in the form of internships, apprenticeships, and cooperative education and are closely aligned to postsecondary programs, and industry-led curriculum (Hoachlander, 2008; Loera et al., 2013). Illustration of programs of the study was evident when Teacher Two stated, “They have the curriculum set up along the state guidelines, and it’s a path to the graphic design certification . . .” Another example of the implementation of programs of study was Teacher

Three's comment, "I have that Alabama state course of study for my curriculum standards . . . being a restaurant, you know, a national restaurant association school and being affiliated with Prostart, there's a Prostart curriculum as well."

Both rural fringe and rural-distant programs of study include internships in most program areas; however, due to the distance to internship sites and lack of transportation, rural-remote programs offer few internships.

Integration of academics and career technical skills. According to 40 percent of participants, high-quality career and technical education integrate rigorous career technical education courses, and academic courses aligned with post-secondary education. Director One explained this when she said,

Most kids don't know when they are sitting in math why they're doing that . . . I use to teach Excel, and I had kids that were in calculus and could not tell me a formula for how to calculate sales tax. So they may know how to do high-level math, yea, but they have no idea how to apply anything, and they get that through career tech.

Another example was when Director Five stated, "My favorite part is taking their core stuff like math and science and actually applying it and it clicking."

Integration of academics and career technical skills was identified by half of the rural fringe participants and one-fourth of rural-distant participants. Rural-remote participants did not address the integration of academics and career technical skills.

Pathway through secondary to postsecondary. Some of the participants in this study expressed the belief that high-quality career and technical education programs provide students with a clear pathway where they gain knowledge and skills that continue to build into either a career or as a transition into postsecondary education. An example of career and technical

education programs providing knowledge, skills, and transitions from level to level came from Director One, “You should be an advanced training center is what, what the career tech center should be, and the local school’s career tech programs should be basic classes, and then they come here for more advanced specific training.” This was further illustrated when Director Two said, “Kalamazoo State Community College . . . working hand in hand with them to where it’s hopefully. . . a staircase to a seamless transition into work or postsecondary.”

While participants in rural fringe, distant, and remote areas have programs structured to provide students with a pathway through secondary to postsecondary the implementation is not the same in all areas. Participant schools in rural fringe and rural-distant areas offer sequenced courses that create a solid foundation for students to continue to post-secondary after high school, as well as some dual enrollment opportunities. However, all courses in the rural-remote participating school are offered as dual enrollment courses.

Summary of research question 1. Participants identified four categories of elements that correlate with the Advance CTE Excellence in Action Award (2019) criteria as evident in exemplary rural career and technical education programs. Having exemplary programs requires partnerships with all stakeholders, including industry, education, and community, to provide guidance, program alignment to industry needs, and postsecondary education, as well as, support and promotion of programs. College and career readiness and a real-world learning environment where students can earn industry-recognized credentials or certifications are vital elements of high quality, exemplary CTE programs. Additionally, program characteristics deemed necessary include programs of study, integration of academics and career technical skills, and a pathway through secondary to postsecondary.

Research question 2. The second research question asked, “Are there additional elements evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?” There were three categories of elements identified during the research investigation and data analysis in answer to research question 2. These categories are 1) Career Technical Student Organizations (CTSOs), 2) Evaluation, and 3) Program Characteristics.

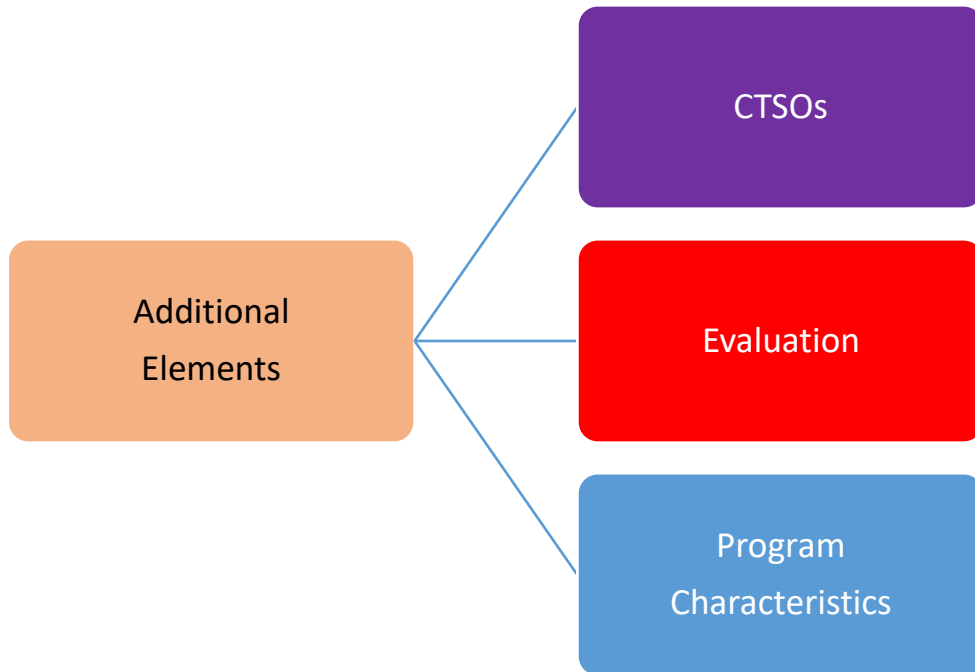


Figure 2. Additional Elements Evident in Exemplary Career Technical Programs

Category 1: Career Technical Student Organizations (CTSOs). Each program area has a student organization that is related to the respective career cluster. According to the participants of this study, CTSOs are an integral part of the career technical program through which students increase their knowledge, skill, and confidence through opportunities to participate in a skill-based competition, networking, and community service. The following quotes illustrate this belief

- “I think an engaging, a CTSO that’s involved is so important. It gives students the opportunity to compete with other students and motivates them to learn the skills more.” (Director Four Transcript, Lines 57-59).
- “FCCLA, FBLA, FFA. But that being an integral component. . .” (Director Five Transcript, Line 185).
- “I have student officers for every block, not just the whole day because they’re different schools, different blocks, different years, and so we elect officers.” (Teacher Two Transcript, Line 234-235).
- “We have active CTSOs . . . every year we end up having people go to the state, national, and whatever and gives them I’m sure a feeling of accomplishment and they learn some leadership skills.” (Director Three Transcript, Lines 100, 103-104).
- “I have FCCLA inside my program . . . So my first year, I had two kids go to nationals. This past year I had four that I took. So that’s a big deal that they’re actually competing, like doing, like creating a project, then competing at state against other students and then going to nationals and competing.” (Teacher Four Transcript, Lines 181-184).
- “I was a state officer . . . So like people I see at things that I go to are people that I worked with as a student. And so that’s something important when you’re in this, and you’re networking with other people.” (Teacher Four Transcript, Lines 185-188).
- “Being involved in the student organization is not necessarily a must, but I think it motivates the kids to do better. It gives them something; they feel like they’ve done something if they participated in a community service project.” (Teacher Five Transcript, Lines 47-49).

- “High-quality technical education to me I think we’ve got to start with the basis of CTSO leadership skills. . .” (Director Four Transcript, Line 16).

While most of the participants believe the CTSOs are an important part of high-quality career and technical education, one rural fringe participant did not share that belief. When discussing competition Teacher Three said, “. . . it’s not a CTSO like the directors love to, or the state gets excited about. So again, I’m anti on that one.” Although Teacher Three does not share the other participant’s belief in the importance of CTSOs, she does feel strongly about students having the opportunity to participate in competition and networking. She stated, “I love competition. That’s one of the main reasons I’m here. I love the kids going, and it’s a different environment. . . The kids learn a lot, but again they’re still networking with those people.”

Participation in competition was the most commonly discussed component of CTSOs. This was identified by all rural fringe participants, three-fourths of rural-distant participants, and half of the rural-remote participants. In addition, rural-remote participants addressed the integration of CTSOs into the classroom, competitive opportunities, and serving the community. Rural distant participants spoke about CTSO integration into the classroom, competitive opportunities, networking opportunities, student recognition, instilling confidence, and applying the skills learned but did not discuss serving the community. Rural fringe participants talked about all seven components of CTSOs in high-quality career and technical education.

Category 2: Evaluation. Another element of exemplary career and technical education programs that was identified by the participants was evaluation. Being visible in the programs, setting high expectations, accountability, and student success were topics that were discussed during the participant interviews. Director One stated, “We also do walkthroughs quite a bit. I mean this morning, I walked through all of one building. You know, just to see what instruction

is going on.” Director Three also said, “We have a fairly big campus, but I walk it and get in every program three times a day and see what’s happening.” Additionally, Director Four indicated the importance of visibility and accountability when he said, “I’m in the classroom every period of every day. And I think just having a presence there is making sure that the teachers know they’re being held accountable.”

Setting high expectations was another topic that arose during the interviews. Teacher Three illustrated this when she said,

The expectations are the expectations, and that’s the way I teach . . . Because if you say this is your box and this is what I expect, and now these are the multiple ways we can get there. Now I’ll help you get there but you still gotta get there.

She later added, “You gotta say this is what I expect, and you got to hold them to it.”

Student engagement was deemed an important part of the evaluation process of a career technical program. Teacher Two expressed this belief with the statement,

To evaluate that is to watch the interaction between the instructor and the student. Do they have a, do they have the right, do they have their finger on the right thing that needs to be done for those students to be engaged.

Teacher Three also spoke about student engagement when she said, “Whether it’s me talking, whether it’s in the lab manipulating something, whether it’s listening to something, whether it’s multiple things at one time you’re not going to see a kid not engaged in my classroom.”

Lastly, student success was identified as a means of evaluating career and technical education programs. Director One expressed this in her statement, “If they’re able to take their skills, take their credentials and move on to that next level, then I think that’s a success.”

Director Three summed up his belief with the statement, “Ultimately, I think the success is based

on the success of your kids.” This was echoed when Teacher Five said, “I would assess number, and I would assess . . . what are the kids coming out with.”

Four out of six rural fringe participants identified some form of evaluation as important to high-quality career and technical education, with keeping the student engaged and teacher accountability being the most commonly noted. Each of the four rural-distant participants identified different components. The four components identified by rural-distant participants were student engagement, student success, program enrollment, and teacher accountability. Rural-remote participants also identified student engagement, setting expectations, and student success.

Category 3: Program characteristics. While some of the characteristics identified by the participants of this study were related to the criteria used for the Advance CTE Excellence in Action Award (2019), there were additional characteristics identified as being evident in exemplary career and technical education programs.

Appropriate student placement and recruitment. One of the recurring responses in participant interviews across rural fringe, distant, and remote areas was appropriate student placement. Student recruitment efforts were used to identify and place students in the appropriate career and technical education programs. Student recruitment tours, as well as an application and interview process, were repeatedly identified as methods used to place students appropriately. All six schools in this study use recruitment tours followed by an application and interview process to identify and appropriately place students.

- "It's gotta be a place where you get the right student in the right class at the right time."
(Director Two Transcript, Lines 45-46).

- “I hate to say this but having the students, those students. You know the ones, not the students who don’t have anywhere to go but actually have the interest.” (Director Five Transcript, Lines 148-149).
- “We went to application process this last year for my first year. . . my first year had to do an application process. . . This year you can tell it’s people that applied. It’s a big difference.” (Teacher One Transcript, Lines 164-167).
- “So our 9th graders we invite, get all the 9th graders to come on campus, take them around, show them every program, let the teacher talk to them, let some of the students talk to them about what’s here, what this is.” (Director Three Transcript, Lines 236-238).
- “We have all the 10th graders come in a tour. They have to fill out an application, and that’s part of the simulated workplace filling out the application.” (Teacher Six Transcript, Lines 71-73).

Passionate teacher. Another characteristic that was common across the interviews was the teacher. Ten out of twelve (83%) of participants identified the teacher as a vital element in high-quality career and technical education programs. One of the most prevalent thoughts expressed by both directors and teachers was the passion of the teacher for their subject area and their students. Director Two expressed this belief when he said, “I think you would start with teachers. Teachers that are passionate and have a background in career and technical education and are genuinely concerned with making a difference, positive difference in the lives of students.” Teacher Two supported this belief as well with the statement, “I would say number one you’d have to have someone teaching that program that has a fire for what they’re teaching.” Director Four also supported the importance of the teacher to in high quality programs, “Number

one is the instructor by far. Even the greatest facilities and equipment you have without an instructor that's building relationships with students, it's not going to be successful.”

Although ten out of twelve participants expressed the belief that the teacher as a vital element, three out of four rural fringe participants and two out of four of rural-distant participants discussed teacher passion as important to high-quality career and technical education, neither of the rural-remote participants discussed teacher passion. However, both of the rural-remote interview participants identified teachers as experts in their field as vital elements of high-quality career and technical education.

Guidance and relevant professional development. Another element revealed during interviews was the support of teachers through guidance and relevant professional development. Director Three spoke to this by saying,

You know, getting them, committing to getting them professional development to see them grow and spend the time even especially with the new ones like I mentioned coming in from industry and . . . having to teach them how to be a teacher . . .

This belief was also apparent from Director Five's statement, "I'm right there for them. I coach them through everything. Just being an instructional coach with them and just take a deep breath." He also later added, "There's a lot of professional development available that would not help a career tech teacher so, so finding those needs and covering it." He went on to say, "We have several non-tenured teachers and just having that support, them knowing they have that support from us." Director Six corroborated this idea when she said, "That they have teaching, good teaching skills and that you give them help for being good teachers because most of them come from industry or other jobs. They're not given that teacher training so making sure they have that . . ."

At least one interview participant from each of the rural area classifications discussed the need for providing relevant guidance and professional development for career and technical education teachers. However, this was most common with rural, distant participants with three out of four, noting its importance. Two out of six rural-fringe and one out of two rural-remote participants discussed the importance of relevant guidance and professional development.

Flexible scheduling. Among the additional elements revealed by participants was flexible scheduling. Fifty percent of all participants identified flexible scheduling as an important component of high-quality career and technical education. Teacher Four gave an example of this.

We had one this past summer; she needed to take Spanish II. So the county paid for her to take ACCESS Spanish over the summer. Summer school is usually here for the county, and so the county paid for that, so now she came to the health science program, and she didn't have to worry about taking an eighth class or choosing between that and Highland Tech.

Director Two supported the need for flexible scheduling when he said, "We've changed our schedule here . . . and it's made our credentialing numbers grow tremendously in the last few years." He explained, "Our principals at our high schools have bought in . . . and I couldn't do it without their support and the central office support allowing us to do this schedule." Flexible scheduling was spoken to by Director Three with his example,

We're gonna open it up some more, you know getting athletes here when you've got your four core plus you've got to take your athletic P.E. . . . Some of the schools have figured a way to work with it with having an extra period and kind of, you know, change.

Although fifty percent of all participants identified flexible scheduling as important, two out of four participants were from a rural-distant school, and none were from a rural-remote school. Four of six rural fringe participants identified flexible scheduling as important.

Collaboration across programs. Collaboration with other instructors was mentioned by participants from rural fringe, distant, and remote schools as playing an important role in the quality of career and technical education programs. This is observed in the following quotes,

- “I mean we just share other ideas. . . We try, we have a faculty meeting either once a week or once every other week, and it’s pretty open. I mean, we discuss, and we talk, and we share.” (Director Two Transcript, Lines 350, 353-355).
- “The only other thing is I think regardless of where the program area is, there’s got to be collaboration among all the programs.” (Teacher Three Transcript, Lines 559-561).
- “I believe a lot of using other resources from other teachers. Even here, we can work together if we need something.” (Teacher Six Transcript, Lines 21-22)

Although there are similarities in schools across all three rural area classifications, there are differences as well. Collaboration across programs was seen as important more often in rural-distant schools. However, rural-fringe and rural-remote participants also identified collaboration across programs as an important component of high-quality career and technical education.

Keeping the program up to date. Up-to-date equipment and facilities play an important role in the quality of career and technical education programs. Having modern, up-to-date equipment is necessary for the programs to remain relevant to industry needs.

- “I think staying current.” (Teacher One Transcript, Line 115).

- “Does that program have the equipment that you know that program should have when you walk in? I think the facilities are huge.” (Teacher Two Transcript, Lines 70-71).
- “We make sure that we’re staying up-to-date with the latest equipment and the latest technology and the needs of our local industry.” (Director Four Transcript, Lines 106-107).
- “So high-quality programs . . . having the equipment, having, having what they need to teach.” (Director Five Transcript, Line 145-147).
- “We know how much the environment affects kids, and they do like something that’s well maintained, taken care of. Good equipment and modern equipment.” (Teacher Five Transcript, lines 101-102).
- “So, I do think equipment and facilities make a big difference.” (Teacher Five Transcript, Lines 108-109).
- “In my program . . . I’ve just received new computers last year, and we have the software up-to-date.” (Teacher Six Transcript, Lines 53-54).

Staying up to date was a recurring component identified by participants in rural-fringe, distant, and remote areas. Participants in all areas spoke about the difficulty in funding for up-to-date equipment. Rural-remote participants discussed obtaining equipment to assist in keeping their programs up to date through industry partnerships. Rural-fringe participants discussed obtaining up-to-date equipment through industry partnerships, as well as raising funds through live-work projects to purchase equipment and federal funding. All rural-distant interview participants discussed keeping equipment and facilities up to date as vital to the quality of career and technical education.

Summary of research question 2. While several elements identified by participants were related to the criteria used for the Advanced CTE Action in Excellence Award, there were three additional categories of elements revealed during the interviews. One of those was career technical student organizations. Each program area has a student organization that is related to the respective career cluster. Participation in a CTSO during high school provides students with the opportunity to gain professional development knowledge and skills, which can benefit them in their chosen career later in life (Alfeld et al., 2006). Evaluation was another element found to be of importance. According to the participants, the evaluation process included setting high expectations, administrator visibility within the programs, accountability, and student success. In addition, there were several program characteristics, also named as valuable elements of high-quality career and technical education programs. The commonly named elements included having passionate teachers, flexible scheduling, guidance, and professional development, keeping programs up-to-date, and appropriate student placement and recruitment.

Table 2

Summary of Characteristics of Career and Technical Education (CTE)

Characteristics of Exemplary CTE	
Partnerships	<ul style="list-style-type: none"> • Industry Partners • Education Partners • Community Partners
Real-World Environment	<ul style="list-style-type: none"> • Accountability • Development of Soft Skills • Job-Related Skills • Simulated Workplace
Program Characteristics	<ul style="list-style-type: none"> • Implementation of programs of study • Alignment to rigorous and relevant college and career-ready expectations • Clear progression of knowledge, skills, and transitions • Student placement and recruitment • Passionate teacher • Guidance and relevant professional development • Flexible scheduling • Collaboration across programs • Up-to-date facilities and equipment
Career Technical Student Organizations	<ul style="list-style-type: none"> • Integrated into program curriculum • Participation in competition
Evaluation	<ul style="list-style-type: none"> • Student Engagement • High Expectations • Accountability • Student Success/Outcomes

Research question 3. Research question three asked, “How do participants perceive the benefits of exemplary career and technical education programs in rural-fringe, distant, and remote settings?” The overarching benefits of career and technical education was providing students with the knowledge and skills needed to make a difference in their lives by providing students with opportunities that might not otherwise be available to them, leadership experiences, and career exploration.

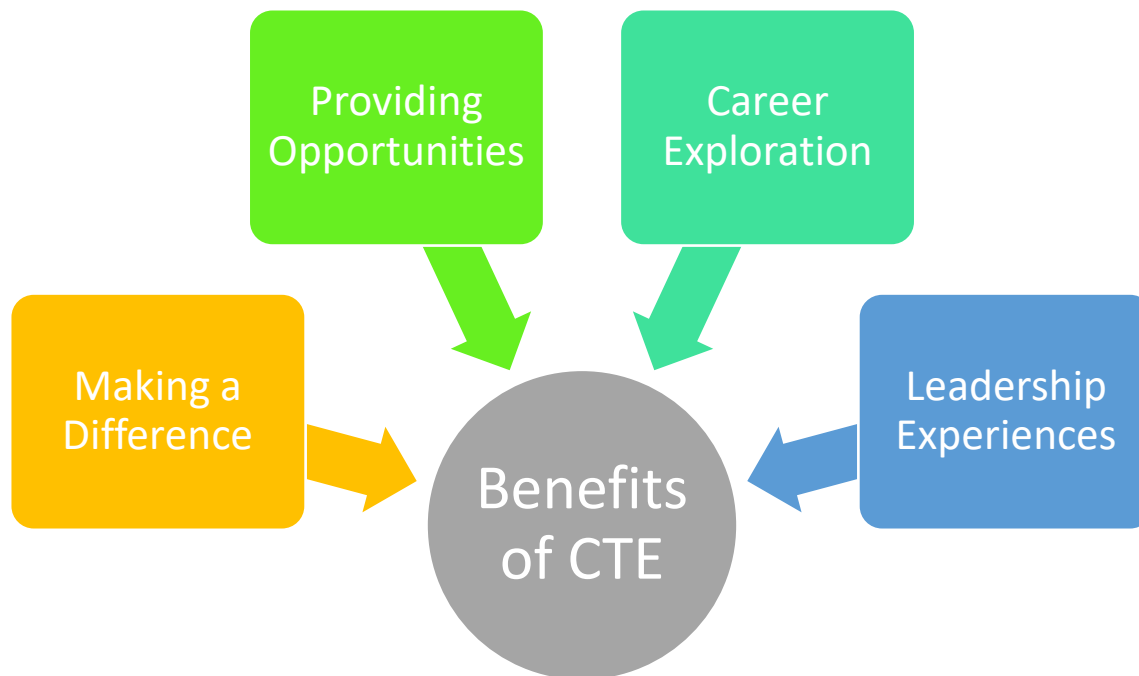


Figure 3. Perceived Benefits of Career and Technical Education

Benefits of career and technical education. The benefits of career and technical education identified by the participants of this student were labeled as four types. These four types of benefits were making a difference in the lives of students, providing opportunities for students, career exploration, and leadership experiences.

Making a difference in the lives of students. Poverty is a very real problem in many rural communities. Rural students' aspirations for postsecondary education are often influenced by the rural environment in which they live. Participants in this study expressed the belief that career and technical education can make a difference for those students. The following are quotes that express that belief.

- “I hope we are cycle breakers . . . that they could have something better for themselves than what they possibly have grown up in.” (Director Two Transcript, Lines 62-64).

- “I was just recruiting my tenth graders and asking them how many of them are going to go to a college, and I was surprised. It’s like ten percent, so for the other 90 percent, I think we are the factor that is going to change their lives.” (Director Four Transcript, Lines 114-116).
- “. . . I see her coming here to leave this program certified as a CNA, and she’ll have the chance to go to the nursing home . . . provide an income for her and her child. And to me, that’s the highlights, seeing the students’ lives changed.” (Director Four Transcript, Lines 25-27).
- “Rural, career tech in rural settings. Breaking the chain of poverty . . . Exemplary career tech breaks the chain.” (Director Five Transcript, Lines 321-322, 325).
- “We want to show them that they can, you know, be somebody that they can own their own home and make their own payments and stand on their own two feet and be independent citizens in society. And that’s breaking the stigma of what they grow up in.” (Director Five Transcript, Lines 346-349).
- “Definitely preparing our students for career and college . . . High-quality technical education is definitely preparing our students for life . . . prepare our students for the next level and the next level.” (Director Six Transcript, Lines 207-209, 212).
- “If I can just help one person, then it’s worth it if no one else is listening all day.” (Teacher Four Transcript, Lines 348-349).
- “I think part of it is knowing somebody cares about you and knowing that education is not reading out of a book all the time.” (Teacher Four Transcript, Lines 391-392).

Some participants from rural- fringe, distant, and remote schools identified making a difference as a benefit of high-quality career and technical education. The participants who

discussed this benefit included four out of six rural fringe participants, two out of four rural-distant participants, and two out of two rural-remote participants.

Providing students with opportunities. According to participants across rural fringe, distant, and remote areas in this study, career and technical education provides opportunities such as scholarships, earning college credit, and jobs that students might not otherwise have available to them. Teacher one described it this way, “These young people can walk out and have a job.” Another example of this was given by Teacher Three when she explained, “I have people that want to hire my kids that are all the way in Port Central.” Director Five also acknowledges the opportunities available in his statement, “Career tech opens doors . . . scholarship opportunities.... I’ve got the skill set. I’ve got the certifications. I’m gonna be making well above minimum wage and be a very marketable employee.” Additionally, Teacher Five said, “I think we give them college credit. We give them money to go to school to go into these professions, or we're giving them certifications and the knowledge to go right into work.”

While providing opportunities that students might not otherwise have was identified by participants from all rural classifications in this study, rural-remote participants spoke most about job opportunities offered to their students after graduation, which were the result of credentials or certifications earned in career technical program. One rural-remote participant also mentioned scholarship opportunities as a benefit for their students. Both rural-fringe and rural-distant participants discussed job opportunities but also discussed scholarships and earning college credit as a benefit for their students.

Career exploration. Participating in career and technical education programs allow students to explore career options while still in high school. Teacher Four spoke to this when she said, “They are able to experience it and see if it’s something they’re really interested in before

they spend money.” This was also expressed in Director One’s statement, “So that at least gives them some opportunity to do some career exploration.” Still, another example was Teacher Three saying, “Kids are being exposed to things earlier. They know that’s an option where they wouldn’t have normally known if their parents weren’t in it.”

Career exploration is one of the benefits that was not discussed by rural-remote participants and was discussed by only one out of four rural-distant participants. However, four out of six rural fringe participants discussed career exploration as a benefit of high-quality career and technical education.

Gaining leadership experiences. Whether through participating in career technical student organizations, simulated workplace, or simply being a part of a career technical education program, participants of this study identified gaining leadership experiences as a benefit for the students. The following quotes support this statement,

- “. . . it’s definitely what you think of with like our CTSOs that it’s student-driven, student-run organization. Definitely, I would say that in the classroom in education and training it’s a very much student-led, student-run program. . .” (Director One Transcript, Lines 40-42).
- “I have student officers for every block, not just the whole day because they’re different schools, different blocks, different years, and so we elect officers.” (Teacher Two Transcript, Lines 234-235).
- “Every year, we end up having people go to the state, national, and whatever, and it gives them, I’m sure, a feeling of accomplishment, and they learn some leadership skills.” (Director Three Transcript, Lines 103-105).

- “. . . returning students taking on a leadership role.” (Director Five Transcript, Line 260).
- “I do let them have that leadership position, and then sometimes I have to let them figure out that some things won’t work.” (Teacher Five Transcript, Lines 150-151).

Gaining leadership skills was another benefit not discussed by rural-remote participants.

Both rural fringe and rural-distant participants identified leadership skills as a benefit of participation in high-quality career and technical education, including five out of six rural fringe participants and three out of four rural-distant participants.

Summary of research question 3. Participants in this study identified four main benefits of career and technical education for students. Career and technical education can provide students with the knowledge and skills needed to break the cycle of poverty that is prevalent in many rural areas and make a positive difference in their lives. Through participation in career and technical programs, students can also earn scholarships that enable them to continue their education after high school, as well as to earn credentials and certifications that open the door to jobs. Students also have the opportunity to explore various career options before having to make a lifelong career decision. In addition, students in career and technical education programs can gain leadership skills that will benefit them in all aspects of life regardless of their chosen career field.

Research question 4 – What are the challenges of career and technical education programs in rural fringe, distant, and remote settings as perceived by the participants?

There were four predominant challenges of career and technical education identified during this research study. These predominant challenges were working with multiple schools, the negative image/mindset regarding CTE, limited resources, and limited personnel.

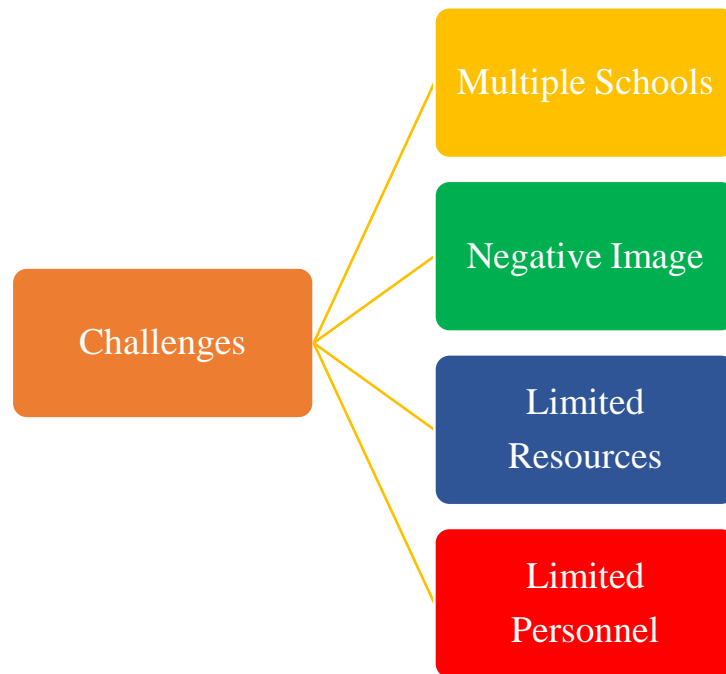


Figure 4. Challenges of Career and Technical Education

Category 1: Challenges of career and technical education. The most prevalent challenges of career and technical education identified during this research investigation and data analysis process were working with multiple schools, a negative image/mindset regarding career and technical education, limited resources, and limited personnel. These four predominant challenges will be discussed in the following section.

Working with multiple schools. The most common response when asked about the challenges of career and technical education was working with multiple schools. The challenge of working with multiple schools was seen in various aspects of the programs. One of those challenging aspects was scheduling. The following quotes are representative of these challenges.

- “I know scheduling is a nightmare.” (Director One Transcript, Line 392).
- “I think for any center like this scheduling is a tough deal and buses and figuring all that out.” (Director Three Transcript, Line 194).

- “Here, I’ve got five county schools and one city school that comes to us.” We’ve got to deal with six different homecoming weeks and activities.” (Director Two Transcript, Line 189).
- “As far as the number game, being a shared time center. Everybody says, well you’ve got seven schools it should be easy to get a class of seven kids. Well, you’ve got seven different master schedules you’re looking at.” (Teacher Three Transcript, Lines 360-362).
- “It’s a large county, so we have five base schools that come in.” (Director Six, Lines 76-77).

Another challenging aspect identified as having multiple levels of students in the same class. This is evident in the following quotes from participant interviews.

- “It’s tough teaching three classes cause we have. So if you’re a teacher, you’re teaching 10th, 11th, and 12th graders all at the same time so first, second, and third year.” (Director Three Transcript, Lines 288-290).
- “I have several three different grade levels, seven different schools. I teach three different courses in one session class three times a day. So you know that’s three sets of lesson plans. That’s three sets of content standards, you know.”
- “They’ll have three, some even four, different levels of students at the same time.” (Director Five Transcript, Lines 16-17).
- “You have a lot you’re doing at once, and then as you can see, I like in my program, my biggest challenge is having all levels at the same time.” (Teacher Five Transcript, Lines 256-257).

- “We have multi groups of students. You may have one group that’s a junior working on a different element of say carpentry and then some that need to be in the shop.” (Director Six Transcript, Lines 23-24).

Lastly, another challenging aspect of working with multiple schools is dealing with the activities of each home school. Director Two voiced this when he said, “We’ve got to deal with six different homecoming weeks and activities.” Teacher Four also spoke to this when she said, “We have four different homecomings. We have four different senior trips. Four different, you know I mean like so that aspect of it is a lot.”

Working with multiple schools was the most commonly discussed challenge across rural fringe, distant, and remote participants. Scheduling was mentioned by participants in all three rural classifications, as was teaching multiple levels of students in the same classroom. Some aspects of the challenge of working with multiple schools were seen differently by directors than by teachers. Only one rural-distant director did not discuss scheduling as a challenge of working with multiple schools, while only two rural fringe teachers discussed scheduling, and no rural-distant or rural-remote teachers talked about scheduling. Dealing with activities of each home school was identified by rural fringe and rural distant but not rural remote.

Negative image/mindset regarding career and technical education. In the past, career and technical education has been seen as a means for educating only the low income, minority students, and low achieving students. Although there have been efforts to change this mindset, participants in this study expressed this as a challenge they still face today. This feeling was evident in Director One’s statement, “I think the biggest obstacle is k12 cause they don’t understand us. . . It’s almost like we speak a different language.” Director Three stated, “Yeah, well, I think one of them is getting, and we’ve had some, but as a whole career tech’s still seen as

the place where the lower kids go.” He explained, “. . . it’s not just the parents. It’s the teachers and the principals and the counselors to get them to change their minds too.” Director Four spoke to this challenge when he said.

Another struggle I have here, and I think it’s everywhere, is getting support from the feeder schools...We have students that tell us they are told, ‘Don’t go over there. That’s not for students that are going to college. . .

Teacher Three also expressed this in her statement, “I think parents and counselors need to be the ones that are educated the most on the benefits.” Director Five also said, “Other challenges will always be outside perceptions.” He later added,

Career tech is the same and completely different from traditional education at the same time. So working with our peers who are not from this world at all, getting them to understand what we do and the benefits of our programs because they don’t have to send them here.”

Lastly, Teacher Six said, “We really struggled for a long time to get the stigma of VoTech out of people’s minds . . . So changing the stigma of the teacher, the counselors, and just the community at large.”

The challenge of a negative mindset or image regarding career and technical education seems to be more prevalent in rural fringe areas, with five out of six participants (three directors and two teachers) discussing it. It was mentioned by both rural-distant directors but not the rural-distant teachers. The rural-remote teacher discussed the negative mindset or stigma of career technical education while the director did not mention it.

Limited resources. Having limited resources was identified as one of the most common challenges faced by career and technical education. The lack of funding and restrictions on how

allotted funds may be used was seen as a burden by CTE directors and teachers in providing high-quality career and technical education programs. Participants articulated their struggle with resources in the following quotes.

- “There’s always limited resources that you’re dealing with.” (Director One Transcript, Line 201).
- “Funding is one of the big ones to me. I know I’m talking a lot about CTSOs, but as you know, we can’t use any state or federal dollars, well a small percentage of state dollars, on student organizations.” (Director Four Transcript, Lines 69-71).
- “The biggest challenge for me, as far as . . . starting out in the beginning, I would say funding. . . we had challenges trying to figure out how to get the equipment we needed.” (Teacher Three Transcript, Line 347, 354).
- “Challenges. The first one would definitely be funding, especially here in a rural county. We definitely have to get out and kind of beg for money.” (Director Six Transcript, Lines 146-147).

Participants in all areas spoke about the difficulty in funding for up-to-date equipment and facilities. While funding was a common challenge across the rural classifications, it was addressed differently in all three rural areas. Rural-fringe participants discussed obtaining up-to-date equipment through industry partnerships and federal funding, as well as raising funds through live work projects to purchase equipment. Only one of the rural-distant participants talked about funding for equipment. He noted that his up-to-date equipment was purchased through grant funding.

Limited personnel. Recruiting and retaining career and technical education teachers was identified as a challenge by the participants. Although career and technical education teachers are

experts in their content area, they often do not have any training in education and earn more working in their field of industry. This was articulated by participants of this study in the quotes below.

- “It’s just that there’s only so much that you can do with the personnel, you know.” (Director One Transcript, Line 200).
- “. . . getting the right people in here and keeping them, training them, and it’s tough sometimes in career tech, I think really.” (Director Three Transcript, Lines 88-89).
- “I’m here to kinda build on the little bit they know and help them progress and become better instructors. So which is a challenge cause most of them are twenty or more years older than me, and they’ve been in industry for a very long time.” (Director Five Transcript, Lines 12-14).
- “One of our biggest barriers really is finding instructors and in keeping them cause we lose them back to industry. They don’t get paid enough, and some of them just can’t handle it.” (Director Five Transcript, Lines 32-34).

Although participants from rural-fringe, rural-distant, and rural-remote areas identified limited personnel as a challenge, it was addressed differently. Rural fringe schools were more like to offer dual enrollment programs on their campus due to the instructor being provided by the community college partner. Rural distant schools reported the teacher to turn over due to their ability to earn substantially higher income working in the industry. In order to address this, one director discussed reaching out to industry partners to assist with finding individuals preparing to retire from jobs within their field. Rural-remote schools reported struggling with limited personnel due to funding. Additionally, rural fringe and rural-distant participants noted the difficulty in keeping qualified teachers due to the lack of training in education.

Summary of research question 4. The participants of this study identified four predominate challenges of career and technical education. CTE directors and teachers face challenges due to working with multiple schools, which include scheduling, teaching multiple levels of students in the same class, and dealing with activities of multiple schools in addition to the career tech center’s activities. The negative image of career and technical education and the mindset is another challenge that must be confronted. Participants also identified limited resources and the restrictions placed on the use of allocated funds as challenging. Additionally, the recruitment and retention of teachers in career and technical education programs was also noted as a struggle that must be addressed. These four areas of challenges were identified in answer to research question four.

Table 3

Summary of Benefits and Challenges of Career and Technical Education (CTE)

Benefits of Exemplary CTE	Challenges of Exemplary CTE
<ul style="list-style-type: none"> • Making a difference in the lives of students 	<ul style="list-style-type: none"> • Working with multiple schools
<ul style="list-style-type: none"> • Providing Opportunities 	<ul style="list-style-type: none"> • Negative image/mindset
<ul style="list-style-type: none"> • Career Exploration 	<ul style="list-style-type: none"> • Limited Resources
<ul style="list-style-type: none"> • Leadership Experiences 	<ul style="list-style-type: none"> • Limited Personnel

Chapter V: Conclusion

The purpose of this descriptive case study was to identify key characteristics of exemplary career and technical education programs in rural areas using the criteria for the Advance CTE Excellence in Action Award (2019) as the basis for the study. In this chapter, the researcher will provide a summary of the study, present major findings from the data, and interpret those findings in relation to the conceptual framework. The researcher then presents implications for practice and recommendations for future research.

Summary of the Study

Workforce needs have changed so that the skills needed to be successful in the current and future labor market have changed. This increase in skill requirement has caused a shortage of qualified workers to fill employer needs. The change in skill requirements, economic globalization, and declining rural population has impacted rural communities and rural schools. CTE provides the skill and knowledge necessary for a skilled workforce to be globally competitive.

In response to the increased requirements for skilled workers, Advance CTE (2019) released a document in 2010 which identified principles for providing excellence in career technical education programs that will prepare a workforce that allows the United States to remain a globally competitive, economic leader. These principles were used to develop the Advance CTE Excellence in Action Award (2019) for exemplary career, and technical education programs across the U.S. The researcher used the Advance CTE Excellence in Action Award (2019) criteria to guide this investigation of exemplary career technical education programs in rural areas.

The study addressed four questions:

1. Are the elements used as criteria for the Advance CTE Excellence in Action Award evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
2. Are there additional elements evident in exemplary career and technical education programs in rural fringe, distant, and remote settings?
3. How do the participants perceive the benefits of exemplary career and technical education programs in rural fringe, distant, and remote settings?
4. What are the challenges of career and technical education programs in rural, fringe, distant, and remote settings as perceived by the participants?

In order to give an in-depth insight into what elements were present in exemplary, rural career and technical education programs and how they were implemented, the researcher used a descriptive case study design. This allowed the researcher to provide a rich illustration of exemplary career technical education programs through the eyes of key stakeholders (Yin, 2018).

Using the National Center for Educational Statistics locale code, the research first identified all schools within the state that were classified as rural fringe, rural distant, and rural remote. Yin (2018) suggests that identification of cases to be studied may include the input of people with knowledge about each of the possible participants. Therefore, the researcher used Reputational sampling was used to identify a list of nine rural career and technical education schools with six of those schools agreeing to participate in the study. Table 1 depicts the participants' demographic data.

Table 1

Participant Demographic Data

Rural Classification	Position Held	Gender
Rural Fringe	CTE Director	Female
Rural Fringe	Teacher	Female
Rural Fringe	CTE Director	Male
Rural Fringe	Teacher	Female
Rural Fringe	CTE Director	Male
Rural Fringe	Teacher	Female
Rural Distant	CTE Director	Male
Rural Distant	Teacher	Male
Rural Distant	CTE Director	Male
Rural Distant	Teacher	Female
Rural Remote	CTE Director	Female
Rural Remote	Teacher	Female

The data collected from these schools were analyzed using qualitative methods to identify categories that were then organized by the research question. Initial coding was used for a first-level analysis of the data collected in this study. The initial coding process allowed the researcher to identify concepts across the data from all six schools. The researcher kept a running list of codes that were categorized using focused coding to identify themes. Color coding was then used to align categories and themes to the research questions. In order to increase the likelihood of accurate findings through the convergence of evidence, the researcher triangulated the data collected from multiple sources, which included career readiness reports, core indicator reports, student placement reports, and equipment and facilities photographs.

Summary of Findings and Interpretation

Research question 1. Participants identified four categories of elements that correlate with the Advance CTE Excellence in Action Award (2019) criteria as evident in exemplary rural career and technical education programs. Having exemplary programs requires partnerships with

all stakeholders, college and career readiness, a real-world learning environment, and specific program characteristics.

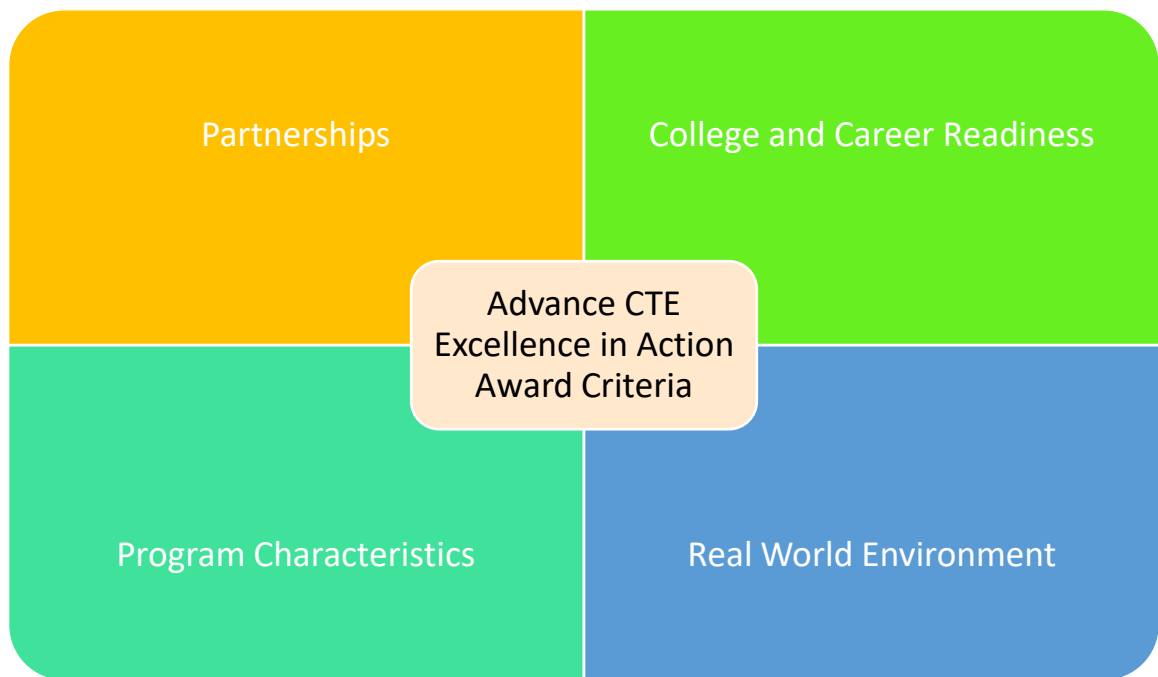


Figure 1. Categories of Elements Present in Advance CTE Excellence in Action Award (2019)

Category 1: Partnerships. During participant interviews, partnerships with industry stakeholders, education stakeholders, and community stakeholders were identified as vital elements in exemplary career technical education programs.

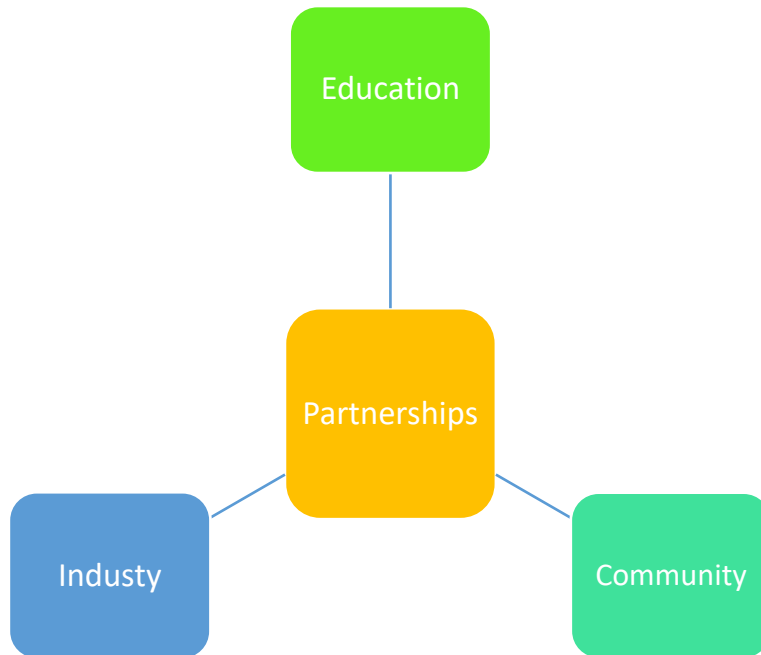


Figure 5. Stakeholder Partnership Groups

Industry partners. The framework developed by the U.S. Department of Education (2012) to guide the design of career technical education programs of study identified industry partnerships as sources for workforce development and labor market data, identification of skills and assessments currently needed in the workforce. According to a study by Griggs et al. (2018), school and industry partnerships provide students with a more in-depth look at the world of work.

The findings from participant interviews indicate that industry partnerships are vital to the success of career and technical education programs. Industry partnerships may provide direct assistance with students in the classroom, financial support, as well as guidance for program needs. These partnerships serve as sources for workforce development and labor market data, identification of skills, and certifications currently needed in the workforce. Industry partnerships allow for collaboration in the development of a curriculum which addresses the identified career

skills needed in particular fields of study, as well as, employability skills needed in all fields (Griggs et al., 2018; Thessin et al., 2018; Watters et al., 2013). The researcher found that the depth of involvement by industry partners decreased as the distance from the school to the industry partners increased. In more rural areas, these partnerships serve in a more advisory capacity as well as providing financial support.

Education partners. Education partnerships include multiple levels of education, including building level administrators, district-level administrators, the local board of education, the state department of education, and postsecondary institutions.

According to the Association for Career and Technical Education (2014), CTE, “. . . features high school and postsecondary partnerships enabling clear pathways to certifications and degrees . . .” This is accomplished through articulated credit agreements and dual enrollment programs in which students earn both high school and college credits for career technical courses. The influence of postsecondary partnerships can often be seen in the structure of secondary programs and the course sequences offered. This was evident in participant schools across all rural classification areas.

In addition to education partnerships with post-secondary institutions, participants in this study felt that partnerships in the form of administrative support are an important element in program success. The researcher found that program support from building level administrators was of great importance to the teachers interviewed. The findings also indicated that partnerships with school-level administrators were necessary, as well as support from the central office level, the local board of education, and the state department of education. Partnerships across all levels of education are necessary; however, more rural schools tended to focus on postsecondary partnerships.

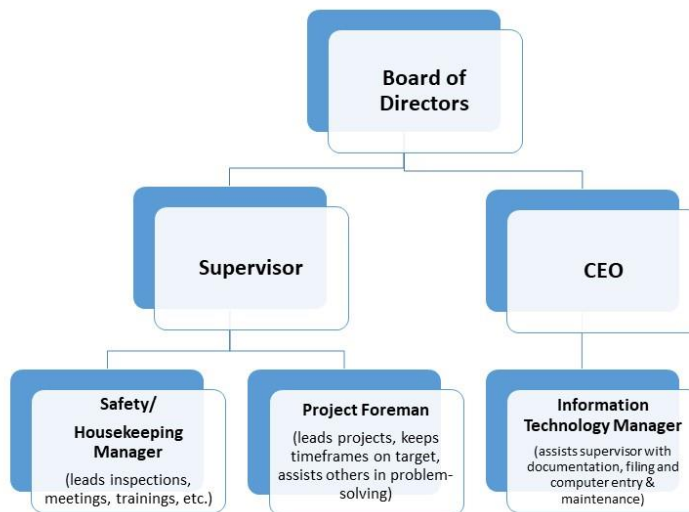
Community partnerships. Community is essential for effectively meeting student needs (Masumoto & Brown-Welty, 2009; Wilcox et al., 2014). This was evident during the interviews when one of the participants shared that community involvement plays a huge role in program outcomes. Small rural schools and communities have the opportunity to develop relationships between staff, students, and the community that helps to build trust between the school, parents, and community (Hargreaves et al., 2015; Horst & Martin, 2007; Masumoto & Brown, 2009). Community partnerships provide support and promotion of programs and may include government officials, parents, and other community members. The researcher also found that community partnerships for most rural schools were limited to financial assistance from businesses within the area.

Category 2: College and career readiness. The goal of career and technical education is to prepare students for life by providing opportunities that will prepare them for both college and work. Career technical pathways integrate academics and rigorous career technical programs to open the door to multiple post-secondary options. Career and technical education combines theoretical academic knowledge with technical skill knowledge providing the students with functional knowledge and skill which allows them to better understand the relevance of both academic and career technical education. Students who understand the relevance of what they are learning are more likely to be successful in both college and career (Hoachlander, 2008).

Throughout all of the interviews, it was apparent that preparing students for both college and career is a significant part of high-quality career and technical education. Participants identified multiple indicators of college and career readiness, including earning college credits through articulation or dual enrollment, which will give the students a foundation for further postsecondary education leading to a certificate or degree. Another indicator of college and

career readiness identified by the interview participants had students earning industry-recognized credentials or certifications that will allow them to go directly into the workforce after high school or reinforce the foundation built for postsecondary education in their chosen career pathway. The findings of this study also most rural schools focused on providing students the opportunity to earn certifications either through dual enrollment or industry-recognized credentials that would allow them to go directly into the workforce.

Pre-Engineering (Drafting) Department Organizational Chart



Category 3. Real-world environment. Both CTE directors and teachers in this study expressed the belief that creating a real-world environment as a vital element in career and technical education. A recent study by Thessin et al., (2017) identified engagement through a real-world context as one of four critical success factors for CTE programs. This real-world environment includes accountability, development of soft skills, and job-related skills in a setting that, as closely as possible, resembles the real-world workplace.

According to eleven out of twelve participants, this real-world environment is accomplished through a simulated workplace. In a simulated workplace, the CTE programs are

structured as much like the industry as possible, with students performing program-related work for people outside the program when possible. Each program has an organizational structure that helps to create an environment of accountability and professionalism. Figure 6 depicts an example of an organizational structure in the simulated workplace.

Figure 6. Example of Simulated Workplace Organizational Structure

This finding supports the literature that found real-world settings provide students with exposure to the realities of the workplace in their chosen career field (Griggs et al., 2018; Stipanovic et al., 2012; Thessin et al., 2018).

Category 4: Program characteristics. The qualitative data from the participant interviews showed that program characteristics deemed necessary for high-quality career and technical education include implementation of programs of study, integration of academics and career technical skills, and a pathway through secondary to postsecondary.

Implementation of programs of study. ACTE (2014) defined a program of study as a sequenced, non-duplicative progression of CTE courses that are designed to connect secondary and postsecondary curricula and to lead to an industry-recognized credential or certificate at the postsecondary level, or an associate's or bachelor's degree. This progression of courses was evident in the description of the curriculum given by participants of this study. One participant shared that his program follows the state curriculum guidelines, which have been set up as a pathway to industry-recognized certification. Another participant indicated that her program is structured according to the industry created a curriculum that prepares students to continue their education in the same career field or to go directly into the workforce. The progression of courses was similar across the rural classifications with the less rural areas, including more

internships as a part of the program of study due to the proximity of industry partners, while in the most rural school, all programs were dual enrollment.

Integration of academics and career technical skills. “Exemplary career and technical education programs in rural areas provide rigorous and relevant career pathways that engage students in planning for their futures, develop their academic, technical, and employability skills, and provide opportunities for work-based learning and mentorship. . . .” (Association of Career Technical Education, 2014, p. 1). Data analysis revealed that students are learning to apply academic knowledge to career technical skills through the integration of core academic theory in career technical programs. One participant shared that teaching students to apply the core knowledge of math and science through career technical education helps them to understand its relevance. Another participant also indicated that students learn to turn theoretical academic knowledge into functional application knowledge through career and technical education. Functional application knowledge is the nature of career and technical education, which may be the rationale for the rural-remote participants not addressing it during the interviews.

Pathway through secondary to postsecondary. Data revealed that participants believe that career and technical education provides students with a clear pathway where they continue to build into either a career or as a transition into postsecondary education. Career and technical education programs are structured so that students begin with basic classes and progress through more advanced specific training in their chosen career field, which may be high school courses or dual enrollment courses. This finding supported the previous study of McCharen & High, (2010), in which they determined that CTE programs of study provide students with a strong foundation and clear pathway to move through secondary education into postsecondary education and the workforce.

Summary of research question 1. The findings of this study indicate that high-quality career and technical education programs include partnerships, college and career readiness, a real-world environment, and program characteristics. A high-quality CTE program provides a rigorous, relevant pathway to postsecondary education or high wage, high demand jobs. Partnerships with industry, education, and the community are vital to providing high-quality career and technical education through guidance and support. These programs must provide students with a strong foundation to prepare them for both college and career through opportunities to earn college credit, and industry-recognized credentials. High quality career and technical education take place in a real-world environment in which students learn accountability, develop soft skills, and gain technical skills. In addition, programs of study through which students' theoretical knowledge becomes functional knowledge, and there is a clear progression of knowledge, skills, and transitions from secondary to postsecondary and then on to the workforce is essential for high-quality career and technical education.

Alignment with conceptual framework. The researcher determined that six of the eight criteria used for the Advance CTE Excellence in Action Award (2019) were directly evident in the data collected through the interviews with career technical directors and teachers. While one of the remaining two criteria was evident in the documents analyzed during the triangulation of data, the other remaining criteria were implied by the structure and progression of the programs.

Research question 2. There were three categories of elements identified during the data analysis in answer to research question 2. Are there additional elements evident in exemplary career and technical programs in rural fringe, distant, and remote settings? These categories are 1) Career Technical Student Organizations (CTSOs), 2) Evaluation, and 3) Program Characteristics.

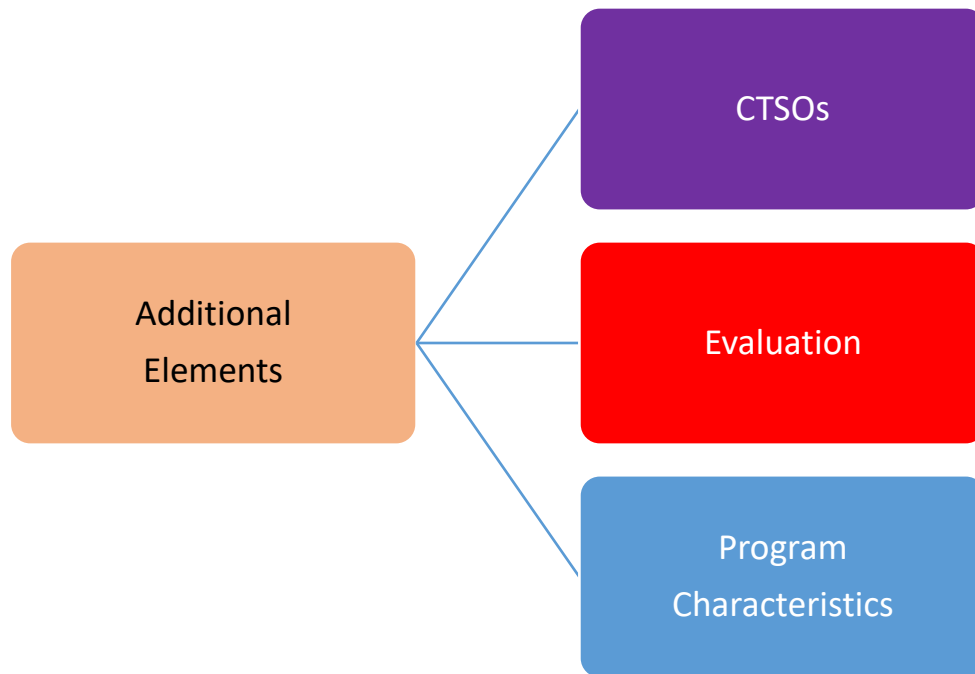


Figure 2. Additional Elements Evident in Exemplary Career Technical Programs

Category 1: Career Technical Student Organizations (CTSOs). Each program area has a student organization that is related to the respective career cluster and is an integral co-curricular component of career technical education. According to a study by Saed & Scates-Winston (2017), through participation in career technical student organizations, students are able to better understand the relevance of academics through their application in hands-on activities.

Participants in this study discussed active, co-curricular career technical student organizations being an integral component of high-quality career and technical education. Students who actively participate in their chosen program area CTSO have the opportunity to compete with other students across the state and nation. According to one director, the opportunity to participate in skill competitions motivates students to learn their skills better.

The study by Saed & Scates-Winston (2017) also found that peer interaction, networking, and skill-based competitions gained through career technical student organizations help to increase student knowledge and confidence. The findings of this study supported this assertion

when directors and teachers discussed students gaining confidence and a feeling of accomplishment through CTSO participation. Participants of this study also indicated that students gain benefits from networking with other students, advisors, and state-level administrators through CTSO participation.

Leadership experience gained through CTSO participation was also discussed by the directors and teachers in this study. Students have the opportunity to serve in CTSO leadership positions at the local, state, and national levels. These experiences are gained through leadership roles within the organization and planning and implementing community service projects discussed by participants in all rural areas.

The researcher concluded that career technical student organizations that are an integral part of the career technical education program provide students with multiple benefits. Students gain confidence, skill, and leadership experience, as well as networking opportunities that will benefit them in their chosen career field.

Category 2: Evaluation. The researcher concluded that the participants view evaluation of career and technical education programs as not necessarily an official process but one that consists of administrators being visible in the programs, accountability, setting high expectations, and student success.

Directors mentioned walking through each program daily with one director doing walkthroughs in each program every period of every day. This allows the administrator to see what instruction is taking place and any problems that may need to be addressed. One director tied visibility directly to accountability when he mentioned that the presence of the administrator gives teachers a sense of accountability. Other participants also indicated that visibility in the programs helps to keep students and teachers engaged and on task.

One director mentioned that the success of the students when they leave the program is the basis for evaluating career and technical education. This was corroborated through the data analysis of core indicator reports and student placement reports. Another participant also indicated that student outcomes, such as earning credentials, is a part of program evaluation.

The researcher concluded that evaluation plays an important role in high-quality career and technical education. The most common components identified across all three rural areas were student engagement, setting expectations, and teacher accountability.

Category 3: Program characteristics. Six additional program characteristics were identified in answer to research question two during data analysis. These six characteristics were appropriate student recruitment and placement, having a passionate teacher, guidance, and relevant professional development for teachers, flexible scheduling, collaboration across programs, and keeping facilities and equipment up to date.

Appropriate student placement and recruitment. Thessin et al. (2018) found that student career interest is a major factor in student engagement. Therefore, the placement of students in a CTE program that is of interest to them is important to their success. Findings from interviews with directors and teachers revealed the importance of appropriate student placement in career and technical education programs. Participants described this process as beginning in middle school with recruitment tours where students were allowed to visit the programs and talk to the teachers and students before choosing a program pathway. An application and interview process followed recruitment tours to determine appropriate student placement within the career and technical education programs across rural fringe, distant, and remote areas.

Passionate teacher. Participants of this study expressed the belief that the teacher is one of the most important elements of high-quality career and technical education. Having a teacher

who is passionate about their subject area and their students was of vital concern to participants in all rural areas. Participants indicated that having a CTE background in the career field being taught and a desire to make a difference in the lives of students was a top priority in having a high-quality program. One participant felt that having a teacher who builds relationships with students is the most important factor in the success of a career-technical program.

Guidance and relevant professional development. As a result of many teachers coming from an industry background, the need for guidance and relevant professional development was important to high-quality CTE programs. Although it was most prevalent in rural-distant interviews, participants from all rural areas cited guidance, support, and professional development as necessary for many career technical education teachers due to their lack of formal training in education. Professional development for career and technical education teachers must fill the instructional gaps that exist due to going straight from industry into the classroom. The findings aligned with Park et al. (2017), who found that high-quality CTE programs require intensive ongoing professional development for teachers to gain the skills needed for integrated contextualized learning instruction necessary for students to be prepared for whatever pathway they may choose.

Flexible scheduling. According to participants, flexibility in scheduling increases the number of credentials earned by students in the programs. One participant noted growth in credentialing after creating a schedule that allowed students to move through the program as a cohort. Scheduling flexibility also made participation in career and technical education available to a larger and more diverse student population. Allowing students to take other courses online during summer school or through dual enrollment opened the door for students who might not otherwise be able to participate in career and technical education programs. One director noted

that adding an extra period allowed students who participated in extracurricular activities also to take career and technical education courses. Another participant explained how a student who was an honors student was able to take an online course during the summer to satisfy graduation requirements in order to participate in the career technical program for her chosen career field. Flexible scheduling is another element of high-quality career and technical programs that were discussed across all rural areas—adding additional periods, as well as allowing students to take core or other required courses during the summer or online, was noted by participants in rural fringe and rural distant. In contrast, rural, remote participants were limited to students taking additional courses online.

Collaboration across programs. The findings of this study indicate that collaboration with other instructors played an important role in the quality of career and technical education programs. Teachers support each other through sharing instructional strategies, working together to provide simulated work through different programs representing various departments within a business, and participating in campus-wide projects. One rural-distant participant noted that faculty meetings were held at least every other week for teachers to discuss and share ideas. One rural-remote participant commented on the teachers working together when one has a need and sharing resources across programs. In the study by Wilcox et al. (2014), the researchers found that collaboration in high performing rural schools extends beyond the walls of the classroom and even beyond the walls of the school itself.

Keeping the program up to date. To provide high-quality career and technical education programs, facilities and equipment must be kept up to date with industry in the program's respective career field. Meeting the needs of the industry means preparing students as much as possible for the work environment they will face when they transition into the workforce.

Students need to be trained on current industry equipment and software to be prepared to meet the skilled workforce needs of the industry. According to Thessin, et al. (2018), real-world settings provide students with exposure to the realities of the workplace in their chosen career field and is accomplished through industry partnerships which provide students the opportunity to learn in real-world facilities using real-world, state-of-the-art equipment.

Summary of research question 2. Career technical directors and teachers identified three categories of elements that were not directly aligned with the conceptual framework. Active career technical student organizations that are integral, co-curricular components of the program was revealed one of the additional elements. Another additional category was evaluation, which included setting high expectations, administrator visibility within the programs, accountability, and student success. Lastly, participants acknowledged six additional elements that were categorized as program characteristics. Scheduling flexibility, keeping the program facilities and equipment up to date, having passionate teachers, guidance, and relevant professional development for CTE teachers, collaboration across programs, and appropriate student recruitment and placement were all deemed elements of high-quality career and technical education.

Research question 3. There were four overarching benefits of career and technical education discussed by the participants of the study in answer to research question three. How do participants perceive the benefits of exemplary career and technical education programs in rural fringe, distant, and remote settings? The four overarching benefits are making a difference in the lives of students, providing students opportunities that might not otherwise be available to them, leadership experience, and career exploration.

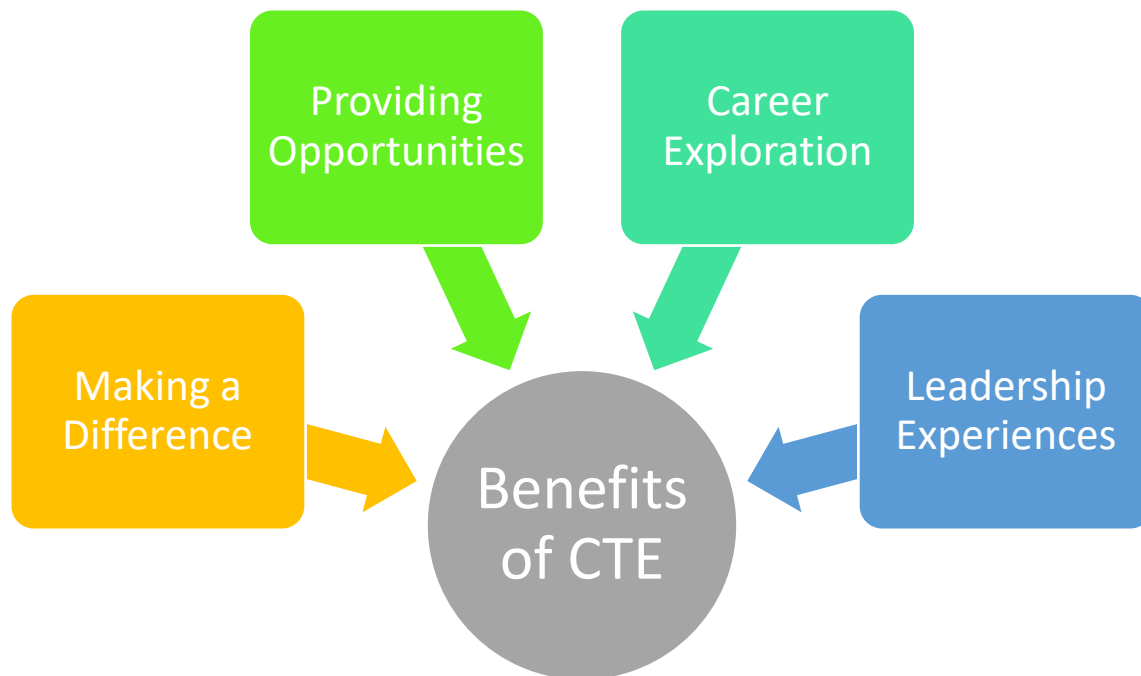


Figure 3. Perceived Benefits of Career and Technical Education

Benefits of career and technical education. Career technical education is a means for providing students with the knowledge and skills needed to be successful in the changing labor market. Through the integration of academics and technical education students gain a better understanding of the relevance of both. This increased understanding provides students with a strong foundation for success in both college and career (Hoachlander, 2008).

Making a difference in the lives of students. Transforming the lives of students living in poverty was one of the most common benefits noted by participants. Educational attainment and economic prosperity are directly related. This has proven to be true for rural areas when compared to urban areas. Wages in rural communities are consistently lower across all educational levels than in urban areas. Higher rates of poverty, child poverty, unemployment, and decreased population is seen in rural counties with lower educational attainment (Fishman, 2015; Gibbs, 2000; USDA, 2017). Participants noted that career and technical education provided students with the skills, knowledge, and credentials to break the cycle of poverty in

which they live regardless of the area in which they live. However, one rural-remote participant indicated that students in more rural areas might have to be willing to move to more populated areas in order to obtain employment depending upon the skills gained.

High-quality career and technical education prepare students to continue into postsecondary education or to go directly into the workforce with skills that will help them become successful members of society. The exposure to specific career skills increased academic relevance, and achievement often motivates students to continue to postsecondary education. CTE program of study students tend to have more postsecondary and career aspirations than the non-CTE program of study students (Castellano et al., 2017; Hoachlander, 2008; Loera et al., 2013; Mobley et al., 2017; Stone, 2017).

Providing students with opportunities. Career and technical education programs offer opportunities to increase the educational attainment of rural students through dual enrollment. Participants across all rural areas indicated that students are provided with opportunities to earn college credits through dual enrollment programs. This was especially noted in the remote rural school, where all programs are dual enrollment. With the increase in technology and distance learning, the opportunities for rural students to enroll in dual credit courses have also increased. Low income students are more likely to earn a bachelor's degree with each semester they are enrolled in dual credit courses (Blankenberger et al., 2017).

Participants noted increased job opportunities for students in career and technical education. This supported previous research that found that rigorous academic education integrated with high quality career and technical education programs provides students with the functional knowledge that leads to more advanced job opportunities (Park et al., 2017).

Career exploration. The creation of an individual learning plan for each student begins no later than the middle school with career development activities beginning before middle school (Loera et al., 2013). Students that take career and technical education courses tend to have a greater awareness of available careers in their chosen career cluster and are more likely to have plans for their future career. CTE students, more often than other students, have participated in career planning activities (Mobley et al., 2017). Rural fringe participants in this study discussed students' exposure to various career options through career and technical education. One participant noted that students have the opportunity to learn about careers they would not have not about without their participation in CTE. Another participant noted that CTE students could experience what is involved in a career without having the expense of post-secondary education. The researcher found that rural distant and remote participants were more focused on specific job skills rather than career exploration.

Leadership experiences. During the data analysis of this study, the researcher identified leadership experiences as one of the benefits of career and technical education. According to a participant, career and technical education students gain leadership experiences through CTSO participation, simulated workplace, and student-led, the student-driven curriculum in the classroom. Although rural-remote participants did not directly discuss leadership experiences, they did implement the simulated workplace and integrated CTSOs into their programs.

Student officers are elected for each class period in the career technical student organizations. These student officers plan, organize, and oversee activities, competitions, and community service projects of the local CTSO chapter. Students participating in a CTSO attend leadership conferences, competitions, and have the opportunity to hold leadership positions at the state and national level.

The simulated workplace is structured as closely to the industry as possible and provides students with positions within their program, which is called a company. Students may have titles, uniforms, or simply specific responsibilities that signify the leadership role they hold. These positions are rotated regularly so that all students have the opportunity to gain experience in each position.

Students in career and technical education programs also gain leadership experience in the classroom through collaborative projects and live work. When doing live work, students are responsible for all aspects of the project, including communication with the customer, work orders, and completing the work.

Summary of research question 3. Participation in career and technical education provides a variety of benefits for students. One of the most prevalent benefits of CTE was making a difference in the lives of the students. Participants believe that CTE makes a difference by giving students the skills and knowledge needed to be successful in life after high school. Another benefit identified by participants was the opportunities students have that would not have been available to them outside of career and technical education. Students in CTE have the opportunity to earn college credits, earn scholarships, and credentials that will give them a good foundation for post-secondary education or the ability to go directly into the workforce. Career exploration was also noted as a benefit of career and technical education. Students are exposed to various career options through CTE as early as elementary school and even begin creating individual career plans in middle school. Lastly, students in CTE gain leadership experience through CTSO participation, simulated workplace, and classroom projects and activities. Career and technical education provide opportunities that will benefit students regardless of their chosen career field.

Research question 4. The researcher identified four predominant groups of challenges of career and technical education, which included working with multiple schools, the negative image/mindset regarding career and technical education, limited resources, and limited personnel. During the data analysis, the researcher grouped the codes from interview transcripts into the four predominant groups of challenges.

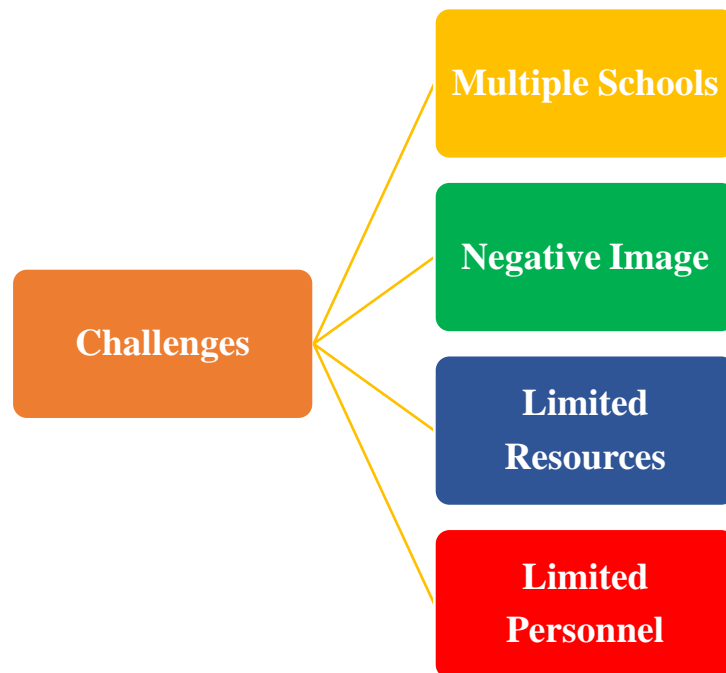


Figure 4. Challenges of Career and Technical Education

Challenges of career and technical education. Curricular challenges exist in many rural schools as they struggle to meet the needs of high achieving students, struggling students, and students with special interests (Williams & Nierengarten, 2011). These curricular challenges include career and technical education programs that can provide job-specific training needed in rural communities. The increase in skill requirement for a qualified workforce has also placed new challenges on career and technical education in rural school districts.

Working with multiple schools. Participants most often cited working with multiple schools as one of the challenges faced in career and technical education. Career technical directors are challenged with creating a schedule that takes into consideration the master schedule at each of the feeder schools, bus schedules, athletics, and other extracurricular activities. The data indicated that teachers most often cited having multiple levels of students in one classroom while directors were more likely to discuss scheduling with multiple schools as challenging.

One participant noted that working with multiple school schedules can often result in small class sizes due to conflicts in students' schedules. Another participant discussed the difficulty for athletes or other students participating in extracurricular activities to participate in career and technical education programs due to scheduling conflicts or transportation issues. Other participants mentioned the challenges of dealing with multiple school activities such as homecoming.

Both directors and teachers in the study discussed teaching multiple levels of students in the same classroom at the same time as a challenge that ties back to scheduling and bus issues. Often buses only transport students from feeder schools one period each day. This requires that all students from that school in each program attend during the same block. Therefore teachers have students of multiple levels from multiple schools in the same classroom at the same time. This was addressed through the simulated workplace structure in which students have roles and responsibilities, and the teacher acts as more of a facilitator of learning.

Negative image/mindset regarding career and technical education. For many years, career and technical education held the stigma of traditional vocational education as a means for educating only the low income, minority students, and low achieving students. Although it has

improved, participants of this study from all three rural classification areas agreed that it is still a challenge they face today by educating not only students, but teachers, administrators, parents, and community members. Participants noted that this mindset is even helped by teachers, principals, and counselors in many of the feeder schools served by the career technical centers. One participant expressed this as a lack of understanding by k-12 educators regarding career and technical education. One director expressed the belief that educators at the feeder schools view career and technical education as a place for students not going to college. Another participant echoed this belief as a lack of understanding of the benefits of CTE. Additionally, one participant in a culinary program noted that parents see the program as nothing more than preparation for working in the fast-food industry.

Limited resources. Although the Carl Perkins Act and the Alabama Legislature provide funding for career and technical education, funding was one of the most commonly identified challenges. Government funding often has restrictions on how the allotted funds may be used. Perkins IV funds are earmarked for program improvement and expansion and may not be used for anything considered consumable materials and supplies.

Participants noted the cost of purchasing and maintaining expensive equipment with limited resources as a challenge. According to two participants, student organizations are a required, integral part of career and technical education, but only a small portion of state allocated funds may be used for CTSOs. Lastly, one director indicated that trying to fund career and technical education was akin to begging in rural areas. All participants discussed funding as a challenge; however, rural-remote participants were most dependent on industry partners for purchasing and repairing equipment.

Limited personnel. Recruitment and retention of qualified teachers is often difficult for rural school districts (Fishman, 2015). Other research also found that recruitment of high-quality teachers is an ongoing challenge for rural schools and is often compounded by the difficulty in providing professional development opportunities for teachers due to the distance from resources and financial constraints (Biddle & Azano, 2016; Fishman, 2015; Irvin et al., 2012). The struggle to find qualified teachers in rural districts is especially difficult for career and technical education.

The findings of this research study also identified the recruitment and retention of qualified teachers as a challenge for career and technical education. Participants spoke to the difficulty of recruiting quality teachers as a result of their ability to earn higher salaries in the industry than in the classroom. Participants also discussed the difficulty in retaining quality teachers due to their lack of training in education despite being experts in their content area. Professional development and ongoing training for these teachers was seen as vital in less rural areas.

The researcher found that all rural areas struggle with recruiting and retaining qualified teachers. This challenge seems to be more related to the ability of teachers to earn higher wages working in the industry than in education in the less rural areas while most rural areas are limited by funding. These challenges are addressed in much the same way across all three rural areas. Rural schools rely on retirees from industry partners, as well as offering dual enrollment with teachers provided by the community colleges. Most rural schools have to limit the number of programs offered due to their inability to fund additional teacher units.

Summary of research question 4. Directors and teachers in this study identified four predominant challenges in career and technical education. Working with multiple schools in

scheduling, teaching multiple levels of students in the same class, and dealing with activities of each feeder school as a challenge in career and technical education. Challenges also include the negative image/mindset educators, parents, and community members have toward career and technical education. Another challenge faced by career and technical education is limited resources and the restrictions on how allotted funds may be used. Lastly, the recruitment and retention of qualified teachers is a challenge for high-quality career and technical education.

Summary of Research Findings

The researcher identified five categories of elements that are necessary components of exemplary career and technical education. Partnerships with industry, education, and community members were found to be vital to the success of high-quality CTE. According to participants, high-quality CTE requires a real-world environment that looks as much like the industry workplace as possible in which students are held accountable, develop soft skills and job-related skills.

Specific characteristics necessary for high-quality career and technical education include programs of study, alignment to rigorous and relevant college and career-ready expectations, a clear progression of knowledge, skills, and transitions, appropriate student recruitment and placement, passionate teacher, guidance and relevant professional development, flexible scheduling, collaboration across programs, and up-to-date facilities and equipment. In addition, high-quality CTE must include career technical student organizations that are an integral part of the program, as well as evaluation of the program, which includes accountability, high expectations, administrator visibility, and student success.

This research study also benefits and challenges that are associated with career and technical education. The benefits of career and technical education include making a difference

in the lives of students, providing opportunities that might not otherwise be available to students, career exploration, and leadership experiences. The challenges faced by career and technical education include working with multiple schools, negative image/mindset, limited resources, and limited personnel.

Implications for Practice

Career and technical education (CTE) has been shown to improve student achievement, prepare students for both college and the workplace, and provide a more rounded education. The integration of academics and career technical education through programs of study, hands-on, experiential learning, and project-based learning in which students not only learn the concept but the reasoning behind it and how to apply it has been shown to have a positive effect on the passage rate on exit exams, as well as, gains in reading and mathematics (Castellano et al., 2012; Hoachlander, 2008). According to Stone et al. (2008), students who took career technical courses in which math content was integrated significantly increased math scores on traditional standardized tests.

Workforce needs have changed, so that skill requirement has increased, causing a shortage of qualified workers to fill employer needs. The change in skill requirements, economic globalization, and declining rural population have compounded the struggles of rural communities. High-quality career and technical education programs include the integration of academics and career technical knowledge and skills necessary for a skilled workforce to be globally competitive. Findings from this study support the previous research and identified vital elements of exemplary career and technical education programs.

Findings from this study should be shared with education leaders at the state level, as well as, administrators at the district level, principals, and career and technical education

directors in rural areas seeking to improve student achievement and provide students the opportunity to gain the skills necessary to be college and career ready. Understanding the benefits of career and technical education, as well as, its challenges will help them better understand the importance of establishing and supporting exemplary career and technical education programs. Although some elements are seen across all rural areas, the implications for practice differ in ways depending upon location. The more rural areas tend to have greater issues with transportation and distance between feeder schools and from industry and postsecondary schools. The sparsity of the remote rural areas makes partnerships with industry and postsecondary schools more difficult. However, it may be addressed by focusing on preparing students for the workforce through certifications and dual enrollment courses offered on the campus of the career and technical education center.

Structuring career and technical education programs as a real-world setting such as a simulated workplace provide an environment of accountability in which students not only learn and apply academic knowledge but also learn technical job-related skills, soft skills and gain leadership experience. Simulated workplace should be school-wide as much as possible, with each school being the business, and each program is seen as a different department. This encourages collaboration and further represents a real-world work environment.

Although these findings have been aligned into different categories, the elements identified were often intertwined. The structure of a program includes not only the real-world setting but also the sequencing of courses in order to reach the desired outcome, whether that is an industry-recognized credential or successful transition into postsecondary education. This is accomplished through industry partnerships that guide to ensure students are being prepared with skills that meet workforce needs on current equipment. Education partnerships, which include

district-level administration and high school administration, are vital to the appropriate sequencing of courses and flexible scheduling. While district and school-level administrators play an important role in the partnership, career and technical education directors must work closely with them to help them understand the benefits of CTE and how academic instruction is integrated into CTE programs. This integration of academics and career and technical education has been shown to increase student achievement. Career technical education not only prepares students to go directly into the workforce but helps to lay a strong foundation for post-secondary education.

Working with education partners, including both secondary and post-secondary institutions, is vital to choosing appropriate curriculum and course sequencing that will provide rigorous, relevant programs of study that lead to industry-recognized credentials or continuation into postsecondary education.

Administrators at the district and school level should provide guidance and relevant professional development opportunities for career and technical education teachers. Appropriate professional development and support from administration ensure that students are receiving instruction that will prepare them for both college and career. Supporting non-traditional career and technical education teachers can also help to alleviate the challenge of retaining quality CTE teachers.

Hands-on learning activities, academic relevance, peer interaction, networking, and skill-based competitions gained through career technical student organizations help to increase student knowledge and confidence (Saed & Scates-Winston, 2017). This is accomplished through the integration of career technical student organizations in each program area. Administrators should provide the necessary training and support for instructors to serve as advisors for CTSOs.

Recruitment of students and appropriate placement is vital to the success of CTE programs. This is accomplished by exposing students to the available program areas during middle school and establishing an application and interview process to ensure appropriate student placement.

Lastly, increasing partnerships with industry and postsecondary education is of utmost importance to the quality of career and technical education. In order to provide students with curriculum, instruction, and equipment that is up-to-date, administrators and teachers must work closely with industry partners for guidance and funding. Partnerships with postsecondary education help to alleviate the struggle for qualified teachers through dual enrollment opportunities.

Although this study including only schools in rural areas, the findings of this study could be used by state level administrators to develop a model for exemplary career and technical education evaluation.

The researcher concluded that the implications for this study are most relevant for district-level administrators, high school administrators, and CTE directors in all rural areas. Exemplary career and technical education programs provide students with the opportunity to explore various career options and gain skills necessary for success in both college and career. This is accomplished through a rigorous and relevant curriculum that is structured to lead to an industry-recognized credential, or postsecondary education taught in a real-world setting in which students gain academic, technical and employability skills. Passionate teachers who are well supported by the administration through relevant professional development and training and the appropriate placement of students are vital to the success of career and technical education programs. District and school-level administrators must be willing to provide flexibility in

scheduling to meet the needs of students, which may include additional periods or online courses. In addition, career technical student organizations must be an integral part of each program through which students increase their knowledge, skill, and confidence by participating in a skill-based competition, networking, and community service.

Recommendations for Future Research

Rural school districts and career technical education both face many challenges, including financial hardships, recruitment and retention of teachers, and state and federal mandates that are difficult to meet. With increasing focus on preparing all students to be both college and career ready, there has been a great deal of research completed on improving rural schools and on the benefits of career and technical education; however, there is limited research on exemplary career and technical education in rural school districts. The researcher sought to add to the limited research on the elements of exemplary career and technical education in rural areas and the benefits and challenges faced by career and technical education programs.

Further research is needed to explore the implementation of the elements of exemplary career and technical education. A more in-depth look at their implementation could provide administrators with additional guidance for establishing and maintaining an exemplary career and technical education programs.

The researcher concluded that having a passionate teacher is one of the most vital elements of an exemplary career and technical education. Additional research could be conducted to explore the personality of teachers of exemplary career and technical education programs. Researchers might include a type of personality test such as the Myers Briggs Type Indicator or other personality tests.

Working with multiple schools and creating schedules around the base school schedules and activities is often challenging. Additional research on scheduling in career technical centers could be beneficial.

Career and technical education often struggles with teacher retention due to many CTE teachers moving from industry into education with no formal training. Additional research on the effect of structured support, guidance, and ongoing relevant professional development on CTE teacher retention is needed.

Concluding Remarks

This descriptive case study explored the elements of exemplary career and technical education programs in rural areas and their implementation using the Advance CTE Excellence in Action Award criteria as the conceptual framework. The researcher sought to provide a rich illustration of exemplary career and technical education programs as perceived by the key stakeholders in order to add to the limited literature. This study indicated that six of the eight criteria used for the Advance CTE Excellence in Action Award were directly evident in the data collected through the interviews with career technical directors and teachers. While one of the remaining two criteria was evident in the documents analyzed during the triangulation of data, the other remaining criteria were implied by the structure and progression of the programs. The findings of this study also indicated additional elements present in exemplary career and technical education programs. The results of this study could be used by state level administrators to develop a model for exemplary career and technical education. The results could also be used by district level administrators, high school administrators, and career technical administrators inform decisions for the implementation of exemplary career and

technical education programs. This study could also be used to inform efforts to increase student engagement and student achievement.

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