An Analysis of Business and Industry Involvement in Alabama CTE Programs, Teacher Satisfaction, and Perceived Barriers

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Abstract

Alabama's economy is facing a crisis due to a scarcity of skilled workers in the expanding job market. Career and Technical Education (CTE) participants are linked to positive outcomes, but little information is available about the involvement of business and industry partners in Alabama CTE programs. This quantitative research study aimed to determine the perceived involvement of business and industry leaders in Alabama CTE programs, examine teacher satisfaction with business and industry partnerships and identify barriers that affect the relationship. The study involved 102 Alabama CTE teachers from nationally recognized 16 career clusters, with most having a graduate or professional degree, 1- 5 years of industry experience, teaching for 0-6 years, and being predominantly female. The finance cluster showed the highest business and industry involvement, and teachers with more industry experience had fewer perceived barriers to building and maintaining relationships with business and industry partners.

Keywords: Career and Technical Education (CTE), Business and Industry Involvement, Partnership, skills gap, workforce, economy

Alabama's Career and Technical Education (CTE) programs are constantly evolving to meet the needs of today's society. Alabama Governor Kay Ivey proposed solutions for developing a workforce that can be absorbed into various in-demand jobs by providing continuous development programs (Jhons, 2017). Collaboration between stakeholders and educational institutions is critical to attaining objectives and fulfilling potential. The concept of partnership in CTE has existed since the 1920s, and schools' capacity to satisfy the current and future needs of businesses and industries depends on effective partnerships (Pawloswki & Katz, 2014).

The U.S. workforce has a growing skills gap, with young adults lacking the technical and essential skills required to fill middle-class jobs. To fill this gap, schools and industries must develop and adapt specific content that addresses workplace needs. Collaboration between schools and industries can complement children's education when schools alone cannot meet their educational needs. Transitioning from high school to the workplace presents troubling knowledge gaps for many students (Friedel, 2011).

The American dream may remain distant for millions of young Americans entering adulthood without access to marketable skills (Symonds et al., 2011). Preparing young people for successful and productive adult lives needs immediate attention in the American system. Comprehensive school reform is essential for creating meaningful career training pathways, as without better preparation, teenagers and young adults may grow frustrated with inadequate and unavailable opportunities, which lowers their quality of life, increases their burden on society, and leaves many potential contributions unrealized (Symonds et al., 2011).

Charles Prosser was dubbed the "father of vocational education" for his contributions to the field (Prosser Career Education Center, 2021, p. 7). He criticized conventional school curriculums for only focusing on academics and college preparation. Seven of Prosser's theorems (see Table 1) directly relate to the purpose of this study on business and industry leaders' involvement in CTE programs and teacher relationships with business and industry leaders. Teachers must stay current with industry standards and expectations to appropriately prepare students for a future in which their talents are required.

Table 1: Seven of Charles Prosser's Theorems on Vocational Education

Theorems	Focus	Description
Theorem One	Work Environment	It is efficient for vocational education to be taught in an environment like the workplace, where a learner will eventually work.
Theorem Two	Industry Standards	Practical vocational training is only possible when the training jobs are carried out using the same tools, machines, and operations as in the occupation.
Theorem Nine	Industry Needs	Vocational education must recognize conditions and prepare individuals to meet the market's demands.
Theorem Ten	Real World Jobs	Learners can establish process habits more effectively when the training is based on actual work instead of exercises or fictitious tasks.
Theorem Eleven	Partnership	The only reliable content source for specialized training is the experience of masters in the field.
Theorem Twelve	Aligning curriculum	All occupations contain a body of content unique to their field, general teaching will not help develop a competent worker.
Theorem Fifteen	Adaptability	A flexible and fluid administration will make vocational education more efficient in proportion to its elasticity and fluidity rather than rigidity and standardization.

Purpose of the Study

CTE aims to equip students with life skills and prepare them for a confident workforce in business and industry (Brand et al., 2013). To accomplish this mission efficiently, schools, businesses, industry leaders, and other community agencies should work together to prepare students for practical and relevant skills required in the workforce to create a sustainable existence for themselves and their families. Former President Donald Trump signed the most current Perkins reauthorization in June 2018, which included a competitive grant program to "improve and modernize career and technical education and align workforce skills with labor market needs" (Sublett, 2019, p. 5). According to a research study conducted in 2019 by ExcelinEd and Burning Glass Technologies, only 19% of CTE programs meet employers' needs; thus, many programs have been ruled ineffective. Therefore, educating the future workforce should be scrutinized, and examining business and industries' collaboration with CTE programs is vital to ensure that all the credentials offered are helpful to students entering the workforce and meeting the needs of businesses and industries.

CTE programs increase high school graduation rates, postsecondary enrollment, employment rates, and wages, which benefit the economy (Brunner et al., 2021). However, not all qualifications are recognized equally in the workforce, placing some students in low-wage jobs. The Alabama State Department of Education suggests that local schools match curricula based on local needs, aligning with federal government standards (Amrein-Beardsley, 2022).

The popularity of Career and Technical Education (CTE) programs in Alabama has grown. However, research on business and industry leaders' involvement, teacher satisfaction, and perceived barriers is scarce. This study aims to alleviate the skills gap by investigating businesses and industries' perceived level of involvement, teacher satisfaction, and perceived barriers.

Research Questions

The following research questions guided this research study.

1. How do CTE teachers perceive business and industry involvement in Alabama's Career and Technical Education programs?
2. To what extent are CTE teachers of Alabama satisfied with their relationship with business and industry based on the teachers' industry experience and teaching experience?
3. What perceived barriers affect the relationship between Alabama CTE teachers and the business and industry leaders based on the CTE programs, industry experience, and teaching experience?

Literature Review

The updated 2021 course of study for CTE was designed with the assistance of several business partners, and the Alabama CTE department at the state level published an advisory committee handbook to guide CTE and workforce partnership. Advisory committees share a common interest in one or more sections of CTE, including local business and industry professionals, teachers, students, and administrators (Amrein-Beardsley, 2022). They must be formed and maintained by schools receiving federal funding for at least one career and technical education program under the Carl D. Perkins Career and Technical Education Grant Improvement Act of 2006 (Smith, 2013).

Business and industry partnerships are a form of association that links employees across various corporate sectors, focusing on competitiveness and career growth. Schools are the hub of a community, determining its growth and development, and it is necessary to have a collaborative approach to ideas that will significantly impact that community’s future (MacQueen et al., 2001). Scholars like Watters et al. (2013) have fashioned the concept of business and industry partnerships, and they benefit participants in achieving set goals.

Collaboration between schools, businesses, and industries can effectively provide complementary capabilities and competencies for children's education when a school alone cannot give them the necessary education (Griggs et al., 2017; Watters et al., 2013). Knowledge is shared to achieve common objectives, including training the future workforce, developing skills, and assisting students in achieving academic success.

Business and industry partners offer opportunities for students to complete on-the-job training while still enrolled, providing students with skills and financial compensation. At the same time,

companies use student workers' acquired skills to accrue income (Bryan & Henry, 2012). There are benefits to both parties in this situation, such as productivity, effective recruitment, skill enhancement, profit, community recognition, and individual satisfaction.

History of CTE Partnership with Business and Industry

Career and technical education, also known as vocational education, has a long history dating back to 1776. During the early 19th century, public education became more important, focusing on producing workers for various jobs. The Independent Action period (1826-1876) saw industries and schools collaborate to provide students with relevant careers suited to their training (Bryan & Henry, 2012).

The Vocational Education Age between 1876 and 1926 brought about groundbreaking changes, with the first manual career school in St Louis, Missouri, in 1879 (Bryan & Henry, 2012). The 1916 child labor law prohibited minors from working specific jobs, leading to overcrowding in schools. This led to incorporating hands-on and theoretical elements into vocational education programs. Agriculture flourished during this time, and manufacturing companies recognized the value of skilled workers.

The Coming-of-Age between 1926 and 1976 saw women and girls participating in previously prohibited activities (Bryan & Henry, 2012). Following World War I, the number of people entering vocational education increased dramatically. Employers became more open to employing graduates, boys, and girls, with relevant skills appropriate for their careers. Women played a significant role in the production process during WWII due to their training in vocational programs (Gordon, 2008). The partnership between business and industry and vocational education educators strengthened because teachers must teach marketable skills aligned with the local job market.

Legislation that Supports Business Partnerships with CTE

Career and Technical Education (CTE) has a rich history of successful legislation, particularly in authentic learning that involves business and industry partnerships. The Smith-Hughes Act of 1917 established the first federal funding for educational programs, with vocational education programs designed to satisfy the needs of working-class Americans (Walters, 1986). The George-Deen Act of 1936 and the George-Barden Act of 1946 increased vocational education by emphasizing partnerships with agricultural sectors (Gordon & Schultz, 2020).

The National Defense Education Act (NDEA) was enacted in 1958 to ensure that students learn foreign language, mathematics, and scientific abilities for defense (Ogden, 1990). Job-related programs such as commerce, construction, and business drove the expansion of vocational education in 1963 (Bryan & Henry, 2012). The Carl D. Perkins Vocational Education Act of 1984 aims to strengthen learners' competencies for future employment responsibilities, including academics (Gordon & Schultz, 2020).

In 1994, the School-to-work Opportunities Act (STWOA) was enacted to link school and work-based learning with industry partnerships. It aimed to prepare young people for high-skill, high-wage careers but expired in 2001 (Davis & Pollack, 1995). The term "vocational education" was retired, replacing it with "Career and Technical Education" (Stern et al., 2010) as part of the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV). Stern et al. (2010) defined CTE as "providing coherent and rigorous content aligned with challenging academic standards and relevant technical skills needed to prepare for further education and careers in current or emerging professions" (p.24). With $1.3 billion in federal funding, the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) builds on prior legislation, Perkins IV, which requires state and local organizations to conduct an assessment based on community needs (Gordon & Schultz, 2020). Business and industry leaders collaborate with schools to meet community needs. The full implementation of the Act was scheduled to begin in the 2020-2021 academic year.

Benefits and Impact of Business and Industry Partnerships

School-industry partnerships in American education have proven crucial for promoting student success, developing skills, and educating the future workforce (Bryan & Henry, 2012). In the 1920s, when schools alone failed to educate children, industry and schools collaborated to educate children. Schools involved with their communities perform better, have more parents volunteering, support school reform efforts, have higher test scores and attendance rates, and see students with more opportunities to learn outside the classroom (Griggs et al., 2017). Bryan and Henry (2012) stated that business-school partnerships offer exceptional career pathways for graduates. Figgis (1998) found that educational partnerships benefit schools and industries when viewed as strategic investments. Figgis (1998) also found that the companies in the study reaped various benefits due to the win-win situation in which they invested in their future employees. Internship programs enhance graduates' employability by providing them with the knowledge and skills they need to succeed in the real world (Bryan & Henry, 2012). Phillips et al. (2002) found that individuals can become objectively prepared for work beyond high school by engaging in work-based learning and exploration. Hence, business and industry partnerships have improved professional abilities among students (Bryan & Henry, 2012). Other outcomes include increasing employment rates and creating mutual co-existence between businesses, schools, and communities.

Schools and businesses can collaborate to enhance students' ability to connect academic content to real-world contexts. Examples of such partnerships include the Florida School-Community Partnership (FSP) program, which aims to provide learners with the necessary skills for the world market. Another example is a local business and a high school in Mississippi, which focuses on exchanging knowledge to train future workers, develop skills, and foster student success (Willems & Gonzalez-DeHass, 2012). Students gain essential skills from regular, professional interactions with industry partners as part of school-industry partnerships. Superintendents believe that partnerships benefit instruction, learning, teachers, businesses, and the community (Rivkin, 2013). Employees share and grow through their participation in the

academy, contributing to the company's focus on education and investing in its students' future workforce (Griggs et al., 2017).

Barriers to Business and Industry Partnership

The literature indicated that there are also risks to school-business partnerships. Maintaining a standardized process of review and reflection between parties is essential to maintain open communication and prevent communication breakdowns (Kisner et al., 1997). Market incentives may not be widespread, and school partnerships only happen when businesses see immediate financial benefits (Klein, 1995). In rural communities, collaborations have no momentum, and in-person connections can be challenging due to distance, limited transportation options, and high costs (Cohen, 2018). Trust issues and competing interests can hinder the success of these partnerships (Cohen & Morse, 2014). Educators should promote the program and student success to engage the community because, according to Ziegler (2001), people spend their time where it matters most. Ziegler (2001) noted that school business engagement is not deep enough to make a significant difference.

Partnerships with different goals may fall apart due to differing perspectives between education and business leaders (Cohen & Morse, 2014). Employers have high burnout rates among intermediaries and industry associations, so reaching many employers and connecting with local or regional intermediaries is crucial (Cohen, 2018). School-community partnerships can adversely affect students' education performance by focusing on a single partnership practice and negatively impacting academic autonomy (Cohen & Morse, 2014). According to Cohen and Morse (2014), maintaining partnerships is expensive, but Bryan and Henry (2012) argued that maintenance is one of the most challenging challenges in sustaining an effective school-community relationship.

Research Design and Methodology

Setting and Sample

Career and Technical Education (CTE) teachers in Alabama's public school systems were surveyed in the study. The survey was emailed to all CTE teachers representing all 16 career clusters in the state. CTE teachers best fit this research study as CTE programs are deemed the cure to the rapid decline of skilled workers in the U.S. economy (Willems & Gonzalez-DeHass, 2012). The convenience sampling method was utilized because Alabama CTE teachers best fit the population based on geographic proximity, accessibility to the researcher, and willingness to provide information about CTE programs. The survey instrument was chosen for this study due to its capability to collect large amounts of information from a large population, leading to greater statistical power and its availability of validated models (Bhandari, 2020). The survey consisted of 11 questions, three Likert questions, three optional open-ended questions, and five multiple-choice questions. The questions were constructed to address the research questions without burdening the survey participants.

Data Collection

To conduct research that involves human participants, Auburn University researchers must obtain approval from the Institutional Review Board (IRB). The IRB committee approved the conduct of this study. The Alabama State Department of Education representative sent the survey email, and participants were provided with an information letter and a link to the survey. The information letter explained the nature of the study and assured them that no identifiable information would be collected. Participants were informed that their responses would be compiled for academic research use and, if desired, posted, published, quoted, or paraphrased. The questions were designed to address research questions without burdening participants, and question and answer syntax was closely monitored to limit technical jargon. The data was collected anonymously and only accessible by the researcher and significant professor.

Data Analysis

The data collected was analyzed using the Statistical Package for the Social Science (SPSS) software application, which allows users to perform various statistical analyses, including descriptive statistics, inferential statistics, factor analysis, and regression analysis (Field, 2000). The data analysis plan is provided in Table 2. A frequency table was used to explore the research questions to determine selection counts and rates of occurrence. Cronbach's method was used to test for internal consistency. Items that form a scale should measure the same, thus demonstrating internal consistency (Bland & Altman, 1997). The survey questions on industry involvement in Alabama CTE programs, teacher satisfaction, and perceived barriers affecting CTE teachers' relationship with business and industry had a Cronbach's alpha scores of .98, .97, and .87, indicating a sufficient degree of consistency, indicating the measure's reliability (see Table 3).

Table 2: Data Analysis Plan

Research Question	Survey Questions	Variables	Statistical Test(s)
1.How do CTE teachers perceive business and industry involvement in Alabama's Career and Technical Education programs?	(Likert Scale): [Business and Industry Involvement] 1. In your CTE program, rate how involved are local business and industry leaders in each of the following.	Level of involvement	Descriptive Statistics: Mean, Standard Deviation. ANOVA: CTE Programs * level of involvement

Research Question	Survey Questions	Variables	Statistical Test(s)
	(Multiple Choice): [Demographics] 1. What career and technical program (s) are you associated with? Please select all that apply.	CTE Programs	Descriptive Statistics Mean, Mode, Standard
2. To what extent are CTE teachers of Alabama satisfied with their relationship with business and industry based on the teachers' industry experience and teaching experience?	(Likert Scale): [Teacher Satisfaction] 2. Using the following criteria, rate your level of satisfaction with your relationship with business and industry leaders.	Level of satisfaction	Descriptive Statistics: Mean, Standard Deviation ANOVA: Level of satisfaction * Industry experience * * Teaching experience
	(Multiple Choice): [Demographics] 2. Do you have any industry experience in the program you teach?	Industry Experience	Descriptive Statistics Mean, Standard
	(Multiple Choice): [Demographics] 3. How long have you been teaching?	Teaching Experience	Descriptive Statistics Mean, Standard Deviation
3. What perceived barriers affect the relationship between Alabama CTE teachers and the businesses and industry leaders based on the CTE programs, years of industry experience, and years of teaching experience?	(Likert Scale): [Perceived Barriers] 3. Please rate these statements as perceived barriers that affect the relationship between Alabama CTE teachers and business and industry leaders.	Perceived Barriers	Descriptive Statistics: Mean, Standard Deviation ANOVA: Perceived barriers * CTE Programs * Industry experience*

Research Question	Survey Questions	Variables	Statistical Test(s)
			Teaching experience
	(Multiple Choice): [Demographics] 1. What career and technical program (s) are you associated with? Please select all that apply.	CTE Programs	Descriptive Statistics Mean, Standard Deviation
	(Multiple Choice): [Demographics] 2. Do you have any industry experience in the program you teach?	Industry Experience	Descriptive Statistics Mean, Standard Deviation
	(Multiple Choice): [Demographics] 3. How long have you been teaching?	Teaching Experience	Descriptive Statistics Mean, Standard Deviation

Table 3: Cronbach Reliability Test

Question	Cronbach's Alpha	Subscale Items
Level of Involvement	.98	24
Teacher Satisfaction Level	.97	16
Perceived Barriers Impacting Partnerships	.87	18

Results

The survey was created to collect information from Alabama CTE teachers on business and industry involvement in programs they are associated with to determine the level of involvement, teacher satisfaction, and perceived barriers. The survey received a total of 170 responses with 102 completion rates. The survey data was analyzed using Statistical Package for Social Science (SPSS) (Version 29). Most participants reported having a graduate or professional degree (58%) (see Figure 1), having 1- 5 years of industry experience (32%) (see Figure 2), having been teaching for 0-10 years (56%) (see Figure 3), and being predominantly

female (56.9%) (see Figure 4). The majority of the respondents indicated that they were in Business Management and Administration (19.61%), Science, Technology, Engineering and Mathematics (12.75%), and Architecture & Construction (11.76%). In contrast, a minority of the teachers indicated that they were in Transport Distribution and Logistics (0.980), Human Services (0.980%), Finance (1.961%), and Hospitality (1.961%) (see Figure 5). Of the respondents, almost 31% had 0-5 years of teaching experience (see Figure 6).

Hands (2005) and Barnett (2005) agreed that partnerships between schools, businesses, and industry enhanced student learning opportunities and facilitated transitioning from high school to the workplace. Abowitz (2000) contended that a teacher and a business or industry partner uniquely prepare students for meaningful social participation and believed that school-business partnerships are essential for success. Schools involved with their communities perform better, have more parents volunteering, support school reform efforts, have higher test scores and attendance rates, and see students with more opportunities to learn outside the classroom (Griggs et al., 2017).

Figure 1: Educational Level

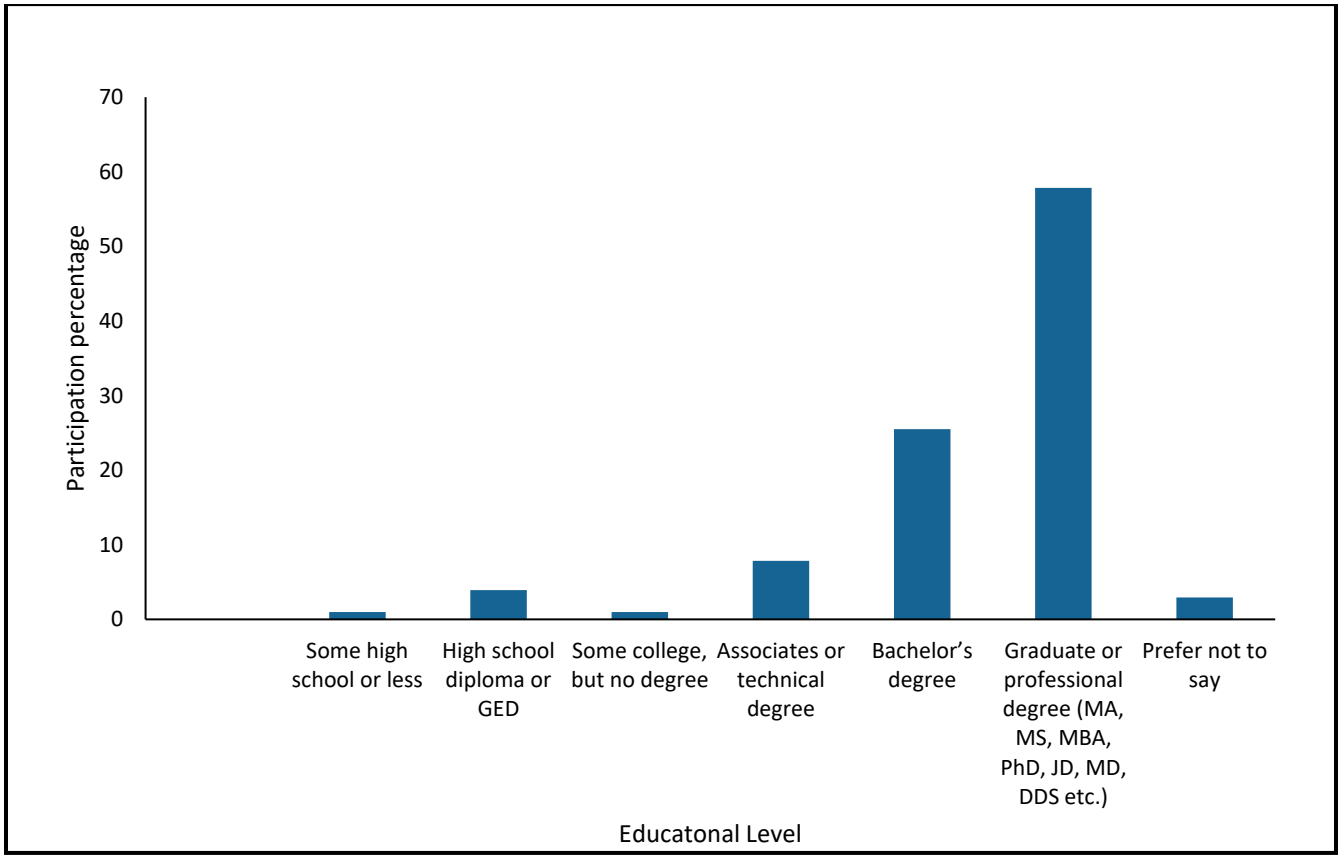


Figure 2: Industry Experience

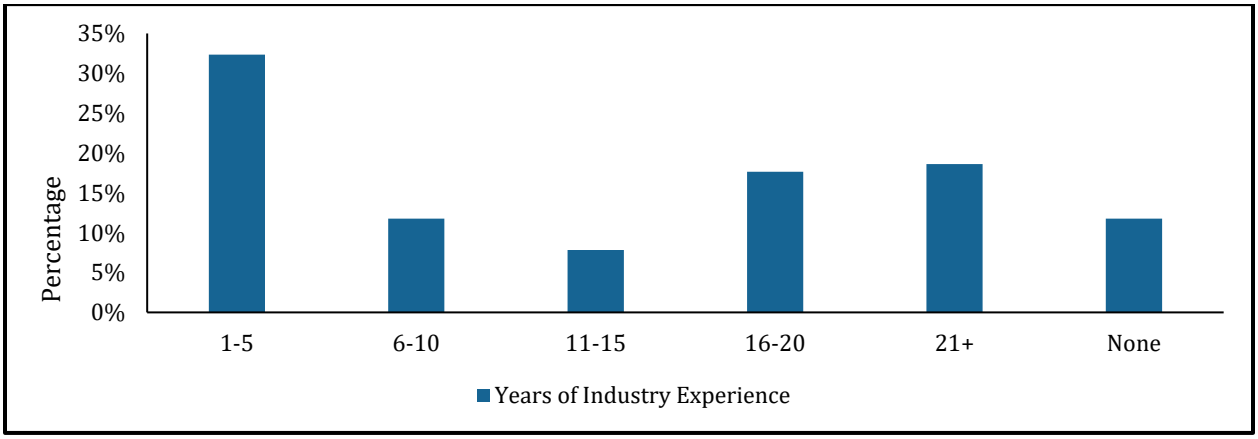


Figure 3: Teaching Experience

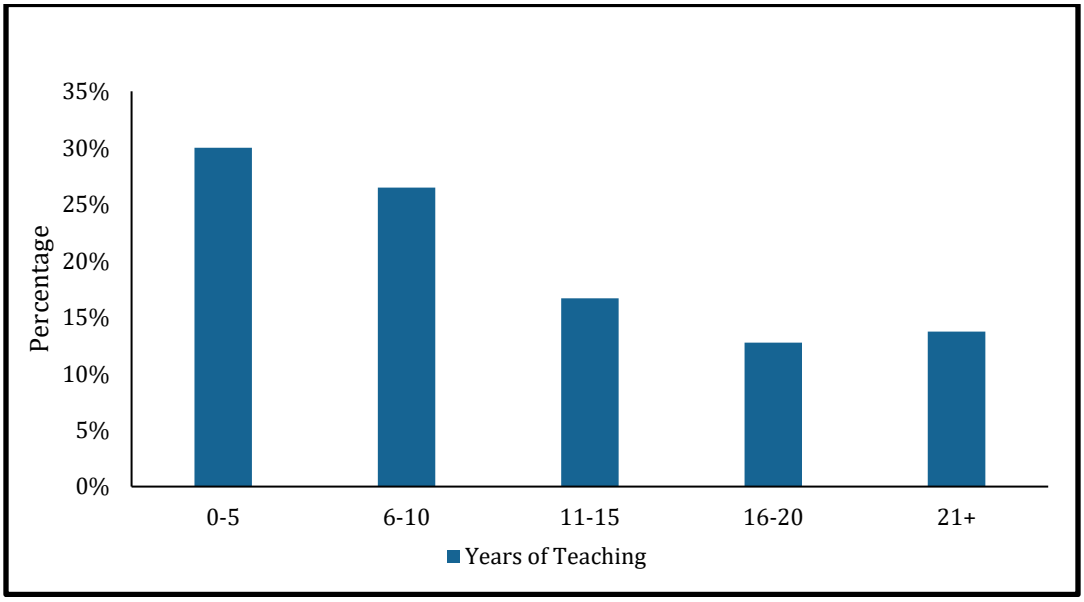


Figure 4: Gender

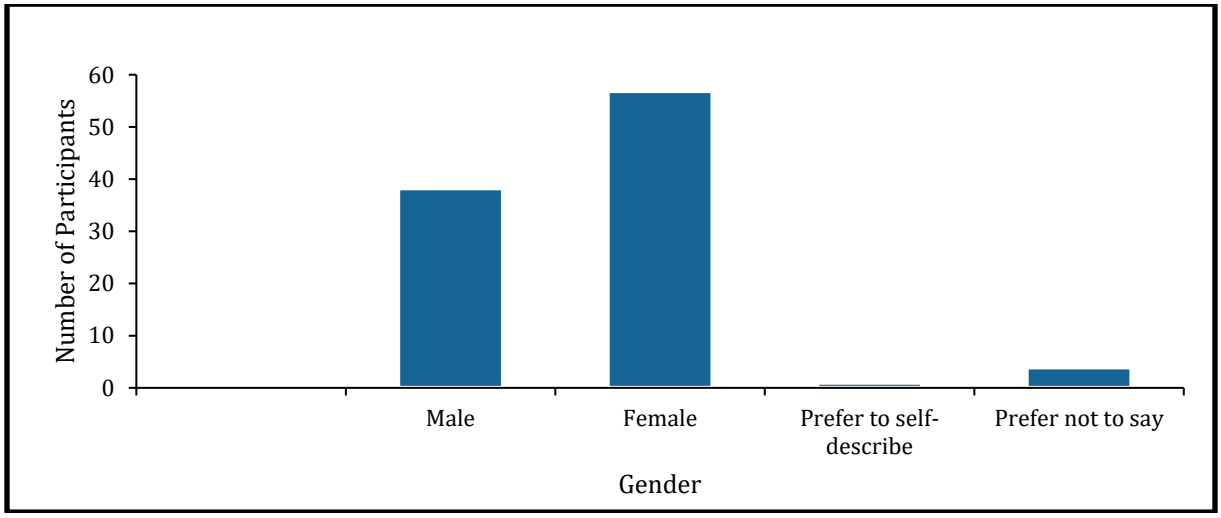


Figure 5: Selected Career and Technical Education Programs

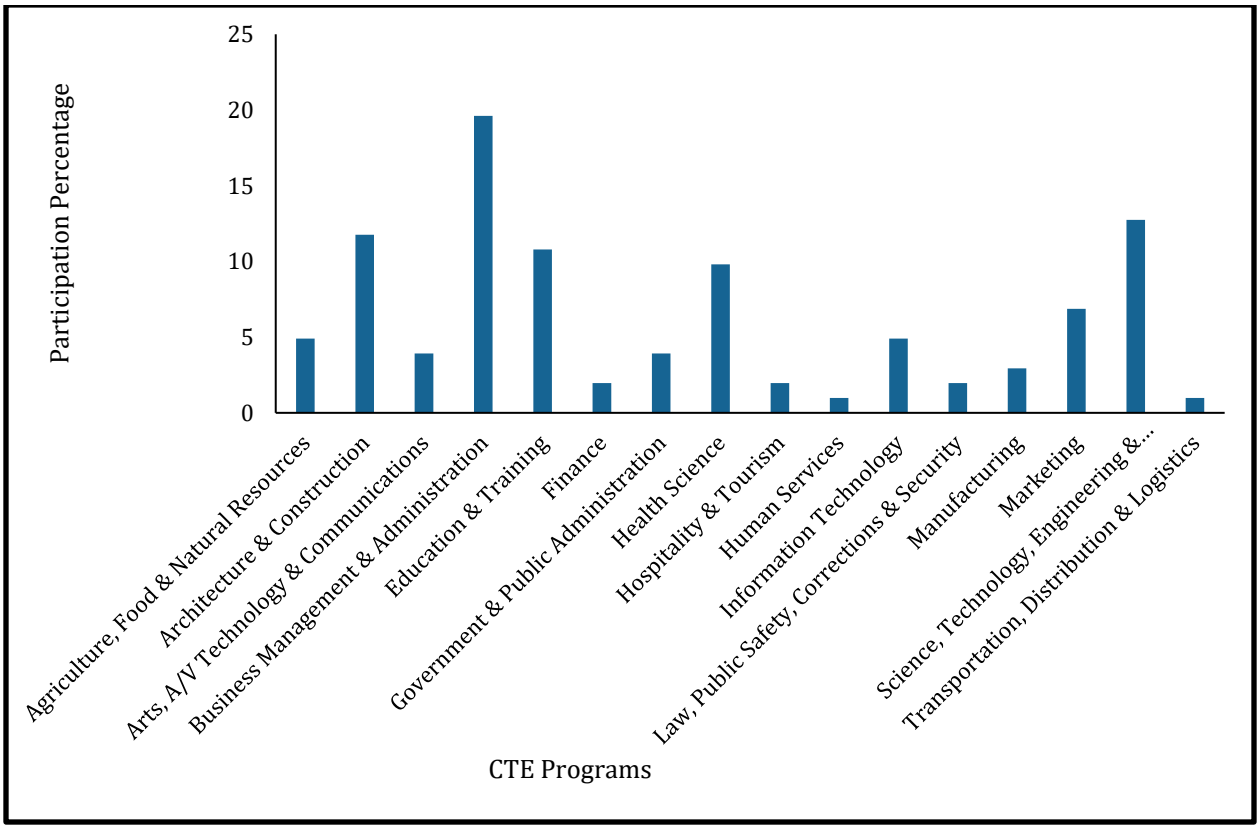
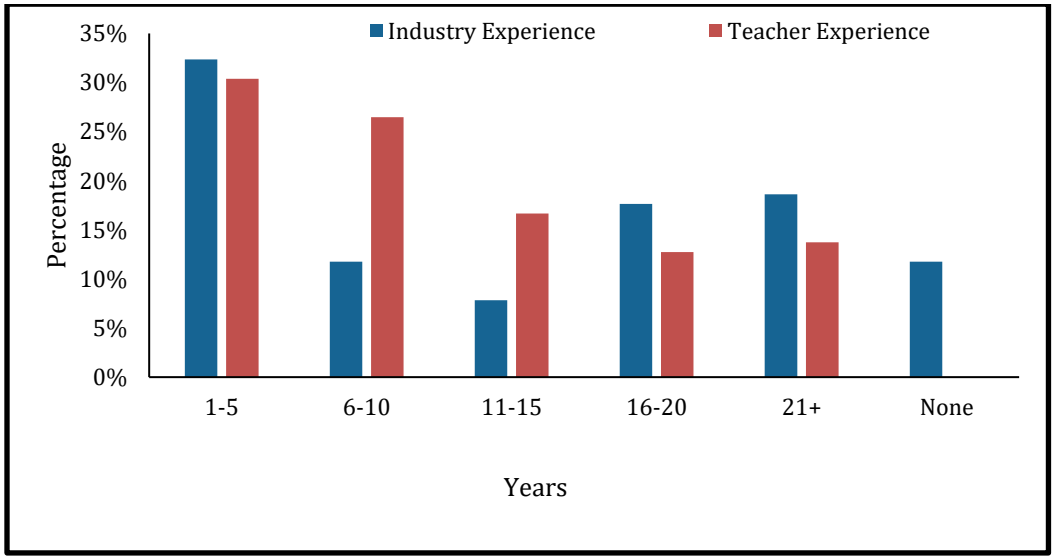


Figure 6: Industry Experience and Teaching Experience



Research Question 1: Business and Industry Involvement Level

Respondents rated how involved are local business and industry leaders in the CTE program on a Likert Scale ranging from 1 = Not at all Involved, 2= Slightly Involved, 3 = Moderately Involved, and 4 = Extremely Involved. The scale range of the Likert Scale is 1-1.75 = Not Involved, 1.76 - 2.5 = Slightly Involved, 2.6-3.25 = Moderately Involved, 3.26-4 = Extremely Involved (see Table 4). Respondents indicated which CTE programs they are associated with (see Figure 5). Assessing the CTE programs data based on the frequency, Business Management & Administration (19.61%), Science, Technology Engineering and Mathematics (12.75%), and Architecture & Construction (11.76%) had better involvement rates, while the minority of the respondents were in the Transport Distribution and Logistics (0.98%), Human Services (0.98%), Finance (1.961%) and Hospitality (1.961%). Results showed that most participants are associated with the Business Management & Administration Program (20) and that businesses and industries are moderately involved.

Table 4: Business and Industry Involvement Level by CTE Programs

CTE Programs	*n*	*M*	*SD*
Agriculture, Food & Natural Resources	5	2.65	1.03
Architecture & Construction	12	2.23	.74
Arts, A/V Technology & Communications	4	2.26	1.01
Business Management & Administration	20	3.10	.82
Education & Training	11	2.84	1.02
Finance	2	3.62	.35
Government & Public Administration	4	2.13	.94
Health Science	10	2.17	.62
Hospitality & Tourism	2	2.38	1.25
Human Services	1	1.71	.
Information Technology	5	2.33	.60
Law, Public Safety, Corrections & Security	2	1.71	1.00
Manufacturing	3	3.06	.67
Marketing	7	2.55	.56
Science, Technology, Engineering & Mathematics	13	2.56	.90
Transportation, Distribution & Logistics	1	2.38	.
Total	102	2.59	.86

Among the various programs, Business Management and Administration has the highest participation rate, with twenty (20) participants (*M*=3.10, *SD*=0.82) indicating moderate involvement of businesses and industries. The Finance programs with only two participants (*M*=3.6, *SD*=3.5) reported that businesses and industries were extremely involved in their programs The following programs also showed moderate business and industry involvement in their CTE programs: Agriculture, Food & Natural Resources (*M*=2.65, *SD*=1.03), Education and Training (*M*=2.84, *SD*=1.02), Manufacturing (*M*=3.06, *SD*=.67), Marketing (*M*=2.55, *SD*=.56), Science, Technology, and Engineering (*M*=2.65, *SD*=.90). Business and industry partners are slightly involved in Architecture & Construction (*M*=2.23, *SD*=.73), Arts, A/V Technology & Communications (*M*=2.26, *SD*=1.01), Government & Public Administration (*M*=2.13, *SD*=.73), Health Science (*M*=2.23, *SD*=.73), Hospitality & Tourism (*M*=2.23, *SD*=.94), Information Technology (*M*=2.33, *SD*=.60), and Transportation, Distribution & Logistics (*M*=2.38, *SD*= 0). Human Services (*M*=1.71, *SD*= 0) and Law, Public Safety, Corrections & Security (*M*=1.71, *SD*=1.00) are the programs indicating that business and industry are not involved.

Research Question 2: Satisfaction Level

The study aimed to understand the satisfaction levels of teachers based on their industry and teaching experience. On a Likert Scale, respondents were asked to indicate their level of satisfaction with the relationship between business and industry: 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neither, 4 = Satisfied, 5 = Very Satisfied. The scale range of the Likert Scale is 1-

1.75 = Very Dissatisfied, 1.76 - 2.5 = Dissatisfied, 2.6-3.25 = Neither, 3.26-4 = Satisfied, and 4.1-5 = Very Satisfied.

Teachers with 1-5 years of industry experience and teaching 0-5 years (*M*=3.73, *SD* =1.11) are mostly satisfied with their relationship with business and industry partners and had the most participation (*n*=17). The satisfaction level based on the teacher's industry experience and teaching experience as shown in Table 5, only one participant with 6-10 years of industry experience and 16-20 years of teaching experience indicated being very satisfied (*M*=4.69, *SD* =0) with the relationship between business and industry. Only one participant in this category with 11-15 years of industry experience and 16-20 years of teaching experience is also very satisfied with the partnership *(M*=4.00, *SD* =0).

Table 5 Satisfaction Level Based on Teachers' Industry Experience and Teaching Experience

Industry Experience	Teaching Experience	*M*	*SD*	n
None	0-5 years	3.33	.58	3
	6-10 years	3.56	.18	2
	11-15 years	3.25	.18	2
	21+ years	3.68	1.29	5
	Total	3.50	.84	12
	0-5 years	3.33	.58	3
1-5 years	0-5 years	3.73	1.11	17
	6-10 years	3.36	.86	6
	11-15 years	3.41	1.34	5
	16-20 years	3.25	2.30	2
	21+ years	3.54	.80	3
	Total	3.57	1.09	33
6-10 years	0-5 years	2.38	1.94	2
	6-10 years	3.71	1.01	6
	11-15 years	3.44	.	1
	16-20 years	4.69	.	1
	21+ years	3.69	.97	2
	Total	3.54	1.13	12
11-15 years	6-10 years	3.67	.59	3
	11-15 years	3.23	.88	3
	16-20 years	4.00	.	1
	21+ years	3.19	.	1
	Total	3.48	.64	8
16-20 years	0-5 years	2.99	1.11	5
	6-10 years	3.16	.40	5
	11-15 years	3.69	.	1
	16-20 years	4.54	.51	7
	Total	3.68	.97	18

Industry Experience	Teaching Experience	*M*	*SD*	n
21+ years	0-5 years	4.22	.51	4
	6-10 years	3.94	.66	5
	11-15 years	3.19	1.21	5
	16-20 years	3.25	2.12	2
	21+ years	3.79	.78	3
	Total	3.70	.98	19
Total	0-5 years	3.55	1.10	31
	6-10 years	3.56	.73	27
	11-15 years	3.31	.97	17
	16-20 years	4.11	1.15	13
	21+ years	3.64	.89	14
	Total	3.59	.98	102

Teachers with 16-20 years of industry experience and teaching experience between 16-20 years reported the highest satisfaction levels with the relationship among business and industry partners (*M*=4.54, *SD* =.51) when participation was more than one (*n*=7). 20+ years of industry experience and teachers teaching 0-5 years were next in line with a satisfaction level of (*M*=4.22, *SD* =.51) and participation *(n*=4). Analysis of Teaching Experience regardless of participants' Industry experiences yield that those teaching between 16-20 years are very satisfied with their relationship with business and industry partners (*M*=4.1, *SD*=1.1, *n*=13) while 11-15 years of teaching experience was the least satisfied with the group (*M*=3.3, *SD*=.97, *n*= 17).

Teachers teaching 21+ years with no industry experience have the highest satisfaction levels (*M*=3.7, *SD* =1.3) with participation (*n*=7). Overall, participants with 16-20 years of teaching experience have the highest level of satisfaction (*M*=4.1, *SD* =1.2) with the least participation (*n*=13).

Research Question 3: Perceived Barriers

Respondents' perceptions of barriers regarding business and industry relationships with Alabama CTE teachers are based on their teachers' industry experience and teaching experience. Using a five point Likert Scale for perceived barriers, the scale for the mean is as follows: 1-1.80 = Strongly Disagree, 1.81-2.60 = Disagree, 2.61-3.40 = Neutral, 3.41-4.20 = Agree, 4.21-5 = Strong Agree.

Results, as shown in Table 6, showed that participants with 1-5 years of industry experience and 21+ years of teaching experience had the lowest mean (*M* = 2.44, *SD* = .45, *n*=3). The results show the perceived barriers based on industry experience and teaching experience. The group with the most participants has 0-5 years of teaching experience (*n*=17) and 1-5 years of industry experience (*M*=2.98, *SD*=.83). With only two participants (*n*=2), in the 16-20 teaching experience and 1-5 years of industry experience has the highest mean (*M*=4.02, *SD*=.67, *n*=2).

Table 6: Perceived Barriers Based on Industry and Teaching Experience

Industry Experience	Teaching Experience	*M*	*SD*	n
None	0-5 years	2.98	0.20	3
	6-10 years	3.11	0.08	2
	11-15 years	2.53	0.12	2
	16-20 years	0	0	0
	21+ years	2.83	1.00	5
1-5 years	0-5 years	2.98	0.83	17
	6-10 years	2.98	0.41	6
	11-15 years	3.26	0.76	5
	16-20 years	4.02	0.67	2
	21+ years	2.44	0.45	3
6-10 years	0-5 years	3.06	0.63	2
	6-10 years	2.61	0.34	6
	11-15 years	3.00	.	1
	16-20 years	2.89	.	1
	21+ years	2.92	0.27	2
11-15 years	0-5 years	2.54	0.69	3
	6-10 years	2.56	.	1
	11-15 years	2.54	0.69	3
	16-20 years	2.56	.	1
	21+ years	3.00	.	1
16-20 years	0-5 years	2.52	0.77	5
	6-10 years	2.89	0.30	5
	11-15 years	3.00	.	1
	16-20 years	2.44	0.98	7
	21+ years	0	0	0
21+ years	0-5 years	2.42	0.78	4
	6-10 years	2.96	1.03	5
	11-15 years	2.60	0.61	5
	16-20 years	2.64	0.20	2
	21+ years	2.67	0.56	3

Participants with 6-10 years of industry experience and 0-5 years and 6-10 years of teaching experience are neutral towards perceived barriers (*M*=3.06, *SD*=.63, *n*=2) and (*M*=2.61, *SD*=.34, *n*=6). On average, participants with 11-15 years of industry experience, 0-5 years of teaching experience, and 11-15 years of industry experience disagree with perceived barriers (*M*=2.54, *SD*=.69, *n*=3). With 16-20 years of industry experience, participants with 16-20 years of teaching experience on average disagree that the perceived barriers are affecting their relationship with business and industry partners in their CTE Program (*M*=2.44, *SD*=.98, *n*=7), while 6-10 years of teaching experience participants have neutral reactions to the perceived barriers (*M*=2.89, *SD*=.30, n=5).

Among participants with 21+ years of industry experience and 0-5 years of teaching experience, the lowest mean (*M*=2.42, *SD*=.78, n=4) disagreed with the perceived barriers preventing relationships with industry and business partners in CTE programs. Teachers with 6-10 years of

teaching experience and a professional with 21+ years of industry experience neutrally reacted to perceived barriers (*M*=2.96, *SD*=1.03, *n*=5).

Further analysis was conducted against perceived barriers based on teaching experience and CTE programs (see Table 7). The results were consistent, with a neutral response ranging from 2.61-3.40. Finance has the highest mean (*M*=3.67, *SD*=1.18, *n*=2) while Manufacturing has the lowest mean (*M*=2.35, *SD*=.52, *n*=3).

Table 7: Perceived Barriers Based on Teaching Experience and CTE Program

Teaching Experience	CTE Programs	*M*	*SD*	*n*
0-5 years	Agriculture, Food & Natural Resources	3.56	1.18	2
	Architecture & Construction	3.39	0.16	2
	Arts, A/V Technology & Communications	3.07	0.67	3
	Business Management & Administration	2.96	0.93	5
	Education & Training	2.52	0.70	3
	Finance	2.83	.	1
	Government & Public Administration	2.00	0.63	2
	Health Science	2.68	0.72	6
	Information Technology	3.17	.	1
	Law, Public Safety, Corrections & Security	2.86	1.22	2
	Science, Technology, Engineering & Mathematics	2.71	0.86	4
	Total	2.84	0.76	31
6-10 years	Agriculture, Food & Natural Resources	3.17	.	1
	Architecture & Construction	2.89	0.71	5
	Arts, A/V Technology & Communications	2.22	.	1
	Business Management & Administration	2.78	0.36	5
	Education & Training	2.93	1.13	3
	Government & Public Administration	3.06	.	1
	Health Science	2.89	.	1
	Manufacturing	2.64	0.20	2
	Marketing	2.97	0.32	4
	Science, Technology, Engineering & Mathematics	3.00	0.73	3
	Transportation, Distribution & Logistics	3.06	.	1
	Total	2.88	0.53	27
11-15 years	Architecture & Construction	2.57	0.38	4
	Business Management & Administration	3.18	0.98	4
	Health Science	3.22	0.31	2
	Information Technology	2.63	0.42	3
	Manufacturing	1.78	.	1
	Science, Technology, Engineering & Mathematics	2.94	0.40	3
	Total	2.82	0.64	17

Teaching Experience	CTE Programs	*M*	*SD*	*n*
16-20 years	Architecture & Construction	2.78	.	1
	Business Management & Administration	2.64	1.22	4
	Education & Training	2.54	0.18	4
	Finance	4.50	.	1
	Health Science	1.44	.	1
	Hospitality & Tourism	3.56	.	1
	Science, Technology, Engineering & Mathematics	2.89	.	1
	Total	2.76	0.92	13
21+ years	Agriculture, Food & Natural Resources	2.44	0.55	2
	Business Management & Administration	2.08	0.98	2
	Education & Training	3.17	.	1
	Government & Public Administration	3.00	.	1
	Hospitality & Tourism	2.78	.	1
	Human Services	2.72	.	1
	Information Technology	1.28	.	1
	Marketing	2.65	0.62	3
	Science, Technology, Engineering & Mathematics	3.06	0.71	2
	Total	2.58	0.67	14
Total	Agriculture, Food & Natural Resources	3.03	0.86	5
	Architecture & Construction	2.86	0.55	12
	Arts, A/V Technology & Communications	2.86	0.69	4
	Business Management & Administration	2.81	0.86	20
	Education & Training	2.70	0.65	11
	Finance	3.67	1.18	2
	Government & Public Administration	2.51	0.70	4
	Health Science	2.68	0.73	10
	Hospitality & Tourism	3.17	0.55	2
	Human Services	2.72	.	1
	Information Technology	2.47	0.76	5
	Law, Public Safety, Corrections & Security	2.86	1.22	2
	Manufacturing	2.35	0.52	3
	Marketing	2.83	0.46	7
	Science, Technology, Engineering & Mathematics	2.90	0.60	13
	Transportation, Distribution & Logistics	3.06	.	1
	Total	2.80	0.69	102

The researcher categorized barriers into intrinsic and extrinsic types (see Table 8). Intrinsic barriers are internal obstacles, such as fear of failure, lack of motivation, or lack of resources, that hinder progress toward goals. Identifying these can help overcome them and achieve higher success (Reiss, 2012). On the other hand, extrinsic barriers are external factors, such as lack of resources, time constraints, or management support (Reiss, 2012).

Table 8: Perceived Barriers Affecting CTE Programs

Intrinsic		
	M	*SD*
The businesses and industries in my area are not interested in a relationship with my program.	2.80	1.27
My program is well known in my area, it is not necessary to maintain business and industry relationships.	2.61	1.29
Too much time is required to maintain relationships with businesses and industries.	2.74	1.30
Relationships with businesses and industries are of little benefit to my program.	2.24	1.31
A great deal of work is required of CTE teachers and developing a relationship with business and industry is often neglected.	3.52	1.16
My industry knowledge is sufficient to operate without needing business or industry relationships.	2.73	1.28
It is not necessary to develop a relationship with local leaders because the curriculum, as written, meets their needs.	2.06	1.12
Business and industry inputs are valuable, so I use personal time to maintain relationships.	3.69	1.09
Extrinsic		
	M	*SD*
My work schedule does not provide time to form a relationship with business and industry leaders.	3.36	1.32
The CTE director independently maintains a relationship with the businesses and industries.	3.40	1.31
The local area does not have any related business and industry with which to form a relationship.	2.49	1.43
I am unable to form a relationship with businesses and industry due to their busy schedules.	2.81	1.29
Businesses and industries maintain relationships with administrators, not with individual teachers.	2.88	1.23
Relationships are only created when the businesses and industry can directly benefit from my program.	2.95	1.26
Using the same business and industry partners repeatedly causes burnout and weakens the relationship overtime.	3.21	1.25
The business and industry leaders tend to overextend their reach when it comes to advising, which ultimate	2.57	1.15
I have a supportive CTE director who encourages me to develop relationships with business and industry leaders.	1.99	1.14
Business and industry value the partnership and are committed to maintaining a close working relationship	2.36	1.14

The intrinsic barriers with the high mean are “A great deal of work is required of CTE teachers and developing a relationship with business and industry is often neglected” with (*M*=3.52, *SD*=1.16) and “Business and industry inputs are valuable, so I use personal time to maintain relationships” with (*M*=3.69, *SD*=1.09). The extrinsic barriers with the highest mean are “The CTE director independently maintains a relationship with the businesses and industries” with (*M*=3.40, *SD*=1.31), followed by “My work schedule does not provide time to form a relationship with business and industry leaders” with (*M*=3.36, *SD*=1.32) and “Using the same business and industry partners repeatedly causes burnout and weakens the relationship over time” with an (*M*=3.21, *SD*= 1.25).

Discussion

Career Technical Education (CTE) aims to prepare students for the real world by providing them with theoretical and applied academic knowledge and skills necessary for successful employment (Friedel, 2011). The American economy is experiencing skills shortages, and CTE is responsible for providing employers with qualified workers. To achieve this, educators, companies, industry leaders, and community agencies must collaborate to provide students with practical skills for a sustainable life. Schools must establish successful partnerships with businesses and industries to meet their current and future requirements. CTE teachers must stay updated on employers' requirements and expectations to prepare students for a future self-sustaining life. A research survey instrument was developed to determine the interaction between Alabama CTE educators and business and industry executives. It analyzed data on their involvement, teacher satisfaction, and barriers preventing the relationship from growing.

The rising volatility of the American economy and the overwhelming shortage of skilled workers have revealed the demand for increased participation in CTE. According to the Association for Career and Technical Education (ACTE), 58% of jobs in Alabama require skills training. However, only 48% of the workforce is fully qualified to perform successfully in these technical jobs. Therefore, knowing that business and industry are moderately involved in six career clusters (Business and Management, Agriculture, Food and Natural Resources, Education and Training, Manufacturing, Marketing, Science, Technology, and Engineering) is good information for future success resulting in skilled workers for Alabama's economy and globally. Finance cluster participants were noted to be highly involved. However, much more work is still needed as seven clusters (Architecture & Construction, Arts, A/V Technology & Communications, Government & Public Administration, Health Science, Hospitality & Tourism, Information Technology, Transportation, Distribution & Logistics) show a slight involvement level from business and industry. Immediate attention is needed in Human Services and Law, Public Safety, Corrections, and Security CTE programs as results indicate that businesses and industries are not involved in their CTE Programs.

To address the widening skills gap, Alabama has set a goal of training an additional 500,000 highly skilled workers by 2025. Hence, schools, businesses, and industry partners must develop and maintain relationships to address workplace needs and ensure that learning is relevant (Watters et al., 2013). However, Cohen and Morse (2014) argued that contemporary society lacks industrial experts, resulting in a lack of preparation everywhere. President Joe Morton of the Business Education Alliance of Alabama said that Alabama is on pace to have a shortage of close to 200,000 highly skilled workers by 2025-2026. The state lacks the right tools to produce more highly skilled workers. However, the overall satisfaction level ranged between 3.26-4, showing that CTE teachers are indeed satisfied with their relationship with business and industry partners in their respective programs. This indicates that Alabama high school graduates will enter the workforce with high-value credentials and skills the business and industry needs. Alabama workforce development has accepted the challenge of changing the pipeline and helping train the skilled workforce to solve economic problems. The participants with 16-20 years of industry experience and 16-20 years of teaching experience report the

highest level of satisfaction with their relationship with business and industry, followed by teachers with 1-5 years of industry experience and teaching 0-5 years. However, overall, CTE teachers teaching 16-20 years have the highest satisfaction level, followed by 21+ years, 6-10 years, 0-5 years, then 6-10 years. The relationship between business and industry leaders and their contributions to the CTE program is unsatisfactory among teachers with 6-10 years of industry experience and 0-5 years of teaching experience. The more industry experience CTE teachers have, the less dissatisfied they are with business and industry partnerships.

Their perception of barriers was analyzed based on respondents' industry experience and teaching experience. Overall, the results show that teachers with more teaching experience considered perceived barriers less of a barrier to building and maintaining relationships with business and industry partners. The descriptive analysis showed that CTE teachers with 1-5 years of industry experience, 0-5 years of teaching experience, and are a part of the Agriculture, Food & Natural Resources strongly believe the barriers listed are significant, which resulted in the breakdown of building and maintaining a relationship with business and industry.

Ziegler (2001) suggested that educators should promote their program and the student's success to engage the community, business, and industry partners because people spend their time and money where it matters most. The data confirmed the suggested perceived barrier with the highest mean and low standard deviation: "A great deal of work is required of CTE teachers, and developing a relationship with business and industry is often neglected" (M = 3.52, SD = 1.16). This suggests that CTE teachers are overloaded with daily work and often overlook adding another required task. Therefore, making an intentional plan and results-driven decisions is needed to ensure CTE teachers have the time to build and maintain these relationships.

The study analyzed perceived barriers CTE teachers face and discovered that most participants with no industry experience responded neutrally to perceived barriers. Overall, the results showed that teachers with more teaching experience considered perceived barriers less of a barrier to maintaining and building relationships with business and industry partners. Agriculture, Food & Natural Resources decreased steadily as the teaching experience increased. Business Management & Administration also showed a decline in average as teaching experience years increased, except for participants teaching between 16-20 years.

Perceived barriers CTE teachers face were divided into intrinsic and extrinsic categories. Intrinsic barriers included the high workload required for CTE teachers and the neglect of developing relationships with businesses and industry. Extrinsic barriers include the CTE director's inability to maintain relationships independently, work schedule constraints, and using the same business and industry partners, which can lead to burnout and weaken the relationship over time. The results align with Bryan and Henry (2012), who state that maintaining and sustaining an effective school-community relationship is one of the most challenging challenges. Employers often face high burnout rates due to their involvement in advisory boards and work-based learning. Reaching multiple employers and connecting with local intermediaries is essential to avoid burnout. However, many rural communities lack

industries, limiting learners' access to diverse career clusters and pathways and leading to using the same business and industry partners.

Limitations

Several limitations existed in this study. Given the small number of cases, quantitative data analysis was not feasible to gather substantial information using the Analysis of Variance statistical test. The convenience sampling method used to collect the data has limitations as it does not represent the entire population and can lead to bias in the results. The data lacks diversity among respondents, which may have impacted the accuracy of the survey results. Also, the small sample size may not have provided a comprehensive picture of the CTE program. Other limitations included trusting a representative from the Alabama State Department of Education to send out the email contacting survey information and the self-reporting survey instrument.

Conclusion

This quantitative study examined the perceived levels of involvement of business and industry in CTE programs, examined teacher satisfaction with business and industry leaders, and identified barriers that affect the relationship between Alabama CTE Teachers and business and industry leaders. Collaboration between stakeholders and educational institutions is essential to achieve goals and realize potential.

The skills gap is on the rise in the US workforce. Young adults lack the technical and fundamental skills needed to fill middle-class jobs. To bridge this gap, specific content needs to be developed and adapted by schools and industries. School-industry partnerships can help students' education when schools cannot meet their learning needs. CTE partnerships with business and industry leaders must be thoroughly evaluated for today's students to succeed. The ALSDE works with various stakeholders to set high academic standards for each CTE program (Amrein-Beardsley, 2022). Unfortunately, there is no regional assessment available for each program area. One of the gaps that necessitated this research was the lack of up-to-date literature on business and industry engagement in Alabama CTE initiatives, teachers' satisfaction with partnering with businesses and industries, and the barriers they see as hindering such partnerships.

This study analyzed the business and industry involvement level in Alabama CTE programs, teacher satisfaction, and perceived barriers. The study revealed that business and industry are moderately involved in Alabama CTE programs, with finance having the highest involvement. Despite Alabama's economy facing a shortage of highly skilled workers by 2025-2026, CTE teachers are satisfied with their relationships with business and industry partners. It indicates that Alabama high school graduates will enter the workforce with the high-value credentials and skills businesses and industries need. The study also found that CTE teachers are often overwhelmed with daily tasks and need more time to establish and maintain relationships with businesses and industries. Barriers to building and maintaining relationships were divided into

intrinsic and extrinsic groups. Intrinsic barriers include the need for extensive work and the importance of personal time for building relationships. Extrinsic barriers include the CTE director's inability to form relationships with business and industry leaders. CTE teachers indicated that employers face high burnout rates due to their involvement on advisory boards and work-based learning due to having the same business and industry partners. Burnouts weaken the relationship over time.

Recommendations

The study revealed that many of the respondents were females in the Business Management and Administration CTE programs. To provide a more accurate representation, it is recommended to increase participation from diverse backgrounds and gender affiliations. The response rate of male respondents was significantly lower, indicating a need for increased outreach to male CTE teachers. Recruiting teachers with industry experience can lead to a better understanding of employers' skills and opportunities for internships and job placements.

To foster and maintain relationships with business and industry partners, specific time should be set aside for continuous growth and development between CTE teachers and business and industry partners. Encouraging teachers to extend their contracts or create schedules would allow them sufficient time for relationship building and maintenance.

Working closely with Agriculture, Food, and Natural Resources programs can help address perceived barriers and ensure more students complete their education with the necessary workforce skills. Reach as many employers as possible and connect with local or regional intermediaries to help avoid burnout among business and industry partners.

The study should use a mixed-method approach, including interview and survey questions, to capture teachers ' perceptions. Increasing the sample size in each CTE program is recommended for better population representation and accurate results. Lastly, choosing times when testing is not in session is also recommended to avoid survey fatigue.

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