

Commentary

# Student Perceptions of Higher Education and Apprenticeship Alignment

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**Abstract:** Since its inception in medieval Europe, apprenticeships have played a vital role in knowledge transfer from one generation to the next. In a mutually beneficial relationship, the master craftsman passes along years of skill and wisdom to the younger apprentice while gaining the youthful, energetic infusion of labor from the burgeoning new learner. In the 21st century, the concept remains largely unchanged, but after years of falling by the wayside, the United States is experiencing a renaissance in the apprenticeship movement. For generations, apprenticeships were marginalized in favor of a more traditional form of classroom-based education now termed Career and Technical Education. However, with economic changes activated by a national ‘skills gap’ and a retiring Baby Boomer generation, the country faces a potential crisis if a skilled workforce is not trained quickly. With just over 500,000 participants nationally, apprenticeship pales in comparison to the 17 million students currently enrolled in higher education. Some of the fastest growing sectors of the American economy such as Science, Technology, Engineering and Math (STEM), and healthcare, have only a few thousand apprentices each. The solution to this challenge lies with the alignment of both methodologies. This article explores the subject of integrating apprenticeship growth and the higher education sector.

**Keywords:** apprenticeship; higher education; career and technical education; skills gap; middle-20 skills; work-based learning; experiential learning

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## 1. Introduction

Choosing a higher education pathway is an extremely complex labyrinth that forces the average 18-year-old in the United States to make life-altering decisions with very little exposure to the field of study. Student have to make major decisions as what institution they will attend, what degree they will seek and how they will finance these choices. The vast majority of students in contemporary high schools focus on the need to pursue higher education, rather than the labor market when they formulate their postsecondary plans. As a result, students are often more concerned with the where than the what when choosing a college [1]. The prevailing mindset is that the only way to succeed economically in the United States is to pursue a Bachelor’s degree [2]. The subsequent demand created an economic boom for the higher education sector, leading to a 500% increase in the number of post-secondary programs between 1985 and 2010, and college tuitions to rise 19 times faster than incomes. A 2018 Georgetown University report found those tuition increases led to student loan debt that has left many graduates questioning their choice to pursue college with 51% of American college graduates indicating they would change their degree, institution or major if they had it to do over again [3].

Despite a clear message that college is important and a pervasive desire among young students to attend college, only about 30% of Americans complete a bachelor’s degree by their mid-20s, with another 10% completing an associate’s degree by then [4]. Although there has been a strong focus in recent decades on increasing college graduation rates, they have improved only slightly [5]. Researchers at Harvard’s Graduate School of Education Pathways to Prosperity project concluded that it would be advantageous if institutions had an alternative system for students who do not earn college

degrees. However, the United States is virtually unique among industrialized countries in terms of not having another system in place and relying so heavily on higher education [2]. Even with the financial and graduation rate drawbacks to higher education, the only decision more expensive than going to college is not going to college [6]. Prior to the 1980s, 70% of the jobs required only a high school diploma and provided stable, middle-class wages for the average American. Now, approximately two-thirds of the available occupations require some form of higher education and training beyond high school.

College graduates with a Bachelor's degree and higher make up the largest section of the workforce population at 56%, but a 4-year degree is not the only way to achieve a successful career in the modern economy [7]. Nearly half of future job growth requires less than a four-year degree and are classified as middle-skills jobs [8].

Following the Great Recession, the American public developed a common misconception that middle-skill jobs vanished from the occupational landscape [9]. Due to sweeping layoffs and relocation of manufacturing jobs to other low-cost countries, many Americans were led to assume that middle-skill jobs diminished in their relevance and importance to the economy [10]. Nevertheless, high demand for middle-skill jobs remains strong due in part to the growing 'skills gap' and the replacement demand created by the retiring Baby Boomer generation [10].

Carnevale et al., found in a 2016 report that only 80,000 of the 11.6 million jobs created since the Great Recession required a high school education or less [7]. Still a decade later, the demand for middle-skill workers remains stronger than the demand for either low-skill or high-skill workers. According to a 2017 study by the National Skills Coalition, middle-skill jobs account for more than 53% of the current U.S. labor market, yet just 43% of workers are currently trained to the middle-skill level [8]. Key economic sectors such as healthcare, construction, information technology, and transportation, which are expanding at above-average rates, offer the middle-skill jobs that make up the largest part of America's labor market.

### *1.1. The Pathway to Middle-Skills*

Unlike the high-school pathway, which declined by 1.8 million jobs since 1991, the middle-skills pathway is still growing with 16 million workers or 26% of the labor market [7]. Middle-skills pathways include some of our most needed sectors including STEM, healthcare, and business. The positions require the acquisition of technical skills gained through education specific to the occupational skill set. This training may occur at the post-secondary level (associate's degree, diploma or certificate credential) or through work-based learning (WBL) programs such as an apprenticeship.

Associate's degree programs have experienced the most growth as the preferred pathway to a middle-skill job. Experiencing an 83% increase since 1991 and adding over 4 million new jobs, growth in associate degree occupations has more than offset the losses by high school graduates [11]. Community colleges, private career and technical colleges and traditional universities offer 2-year associate's degrees in growing high demand career fields to meet the burgeoning demand from both students and employers. While the median earnings of two-year graduates are less than four-years, more than 30% of Associate degree graduates earn more than the average Bachelor's degree graduate. The more in-demand the degree's major, the more the earnings potential grows in this category [6].

### *1.2. Middle-Skills Gained Through Work-Based Learning (WBL)*

Work-Based Learning (WBL), often referred to as experiential learning, is a long-held staple in certain educational sectors. The Career and Technical Education (CTE) sector has incorporated many forms of experiential learning as a mainstay in the continuum of its curriculum design [12]. For generations, the most identifiable, key ingredient of CTE was hands-on, experiential learning [13]. This kinesthetic learning style takes on several forms such as classroom-based skill labs, or work-based learning experiences. Secondary CTE schools sought to incorporate work-based learning into its programming through the advent of Cooperative education partnerships (Co-ops) with local

industry [13]. On the post-secondary CTE level experiential, work-based learning has evolved into internships, externships, clinical rotations, and apprenticeships [14]. In the case of co-ops, internships, externships, and clinical rotations, the individual is a student first and employed later or immediately following their course of study. Apprenticeships operate from the employer side requiring the individual to be an employee first and a student second. In the case of the apprentice, the training is employer driven.

### 1.3. Defining Apprenticeships

Apprenticeships are not a new idea. They are perhaps the oldest form of knowledge transfer in the western world tracing its origins back to medieval Europe where youth workers learned alongside the experts of the craft for several years.

Then as now, it was a mutually beneficial relationship [15]. Apprentices learned skilled trades such as stone mason, blacksmith, and leathersmith; their mentors benefited from their apprentices' progressively more valuable labor. Once a satisfactory level of competence was achieved, apprentices became "journeymen" and certified to practice their crafts independently. Eventually, the student would become the teacher and take on apprentices of their own. This tradition of passing the torch created a system where one generation passed on its knowledge to the next, benefiting both parties and their communities [16].

Interest in apprenticeships in the U.S. waned throughout the modern industrial era, only remaining relevant in the national labor unions like the International Brotherhood of Electrical Workers. However, they remained strong in northern Europe. In Germany, for example, two-thirds of young people become apprentices after high school [16]. Recently, U.S. policymakers have begun to realize the benefits of apprenticeships due to witnessing the achievements brought on by an influx of European manufacturers to the United States who inspired local versions of their centuries-old training system [17]. In 2014, the Workforce Innovation and Opportunity Act (WIOA) was signed into law which solidified apprenticeships into the policy horizon for years to come. WIOA initiated an annual \$90 million budget allocation from the Department of Labor funding apprenticeship initiatives [18]. In addition, both the Obama and Trump Presidential administrations committed another \$250 million and \$200 million respectively in recent years to support the program. Furthermore, the recently reauthorized Perkins Act has a special carve-out for apprenticeship related CTE programming [19]. So, in a fractious world of educational policy, apprenticeship is one of the few ideas to gain bipartisan support.

The effect of this broad-based backing has resulted in the number of registered apprenticeships rising 29% to 505,000 in 2016 [17]. However, the number of apprenticeships in the U.S. totals about 5% of the eligible workforce which pales in comparison to many European countries which see approximately 60% of youth entering into apprenticeships [16]. The U.S. would have to turn out 7 million apprenticeships per year to keep pace with their counterparts in Germany and Switzerland. While that number is not realistic at this stage with only around a half million registered apprenticeships, the Trump administration has assigned a goal to create 5 million new apprentices by 2022 [20]. Traditionally, society views apprenticeships as being representative of the skilled trades professions. The recent passage of WIOA clears the way for the expansion of the apprenticeship ideal to a far broader audience. This statute codifies the definition of 'Registered Apprenticeship' as a U.S. Department of Labor (DOL) certified workforce development strategy that trains an individual in a specific occupation using a structured combination of at least 2000 h of on-the-job training and related instruction. To achieve certification as a Registered Apprenticeship, the program sponsor must submit a comprehensive on-the-job training and educational framework to a DOL official for approval [20]. Virtually every conceivable occupational sector is now authorized to create their own sector-based apprenticeship under this new law [19]. The DOL recognizes over 1000 occupations in traditional industries such as construction and manufacturing, as well as new emerging industries such as engineering, health care, information technology, energy, and telecommunications [20]. Fuller and Sigelman [15], identify in a recent study that certain 'booster' and 'expander' occupations that

offer the most apprenticeship growth potential. They go on to contend in this study that only through a widening of apprenticeship market penetration will the DOL hope to meet its goal of 5 million new apprentices by 2022. An example of these new occupational areas targeted for expansion are Claims Adjusters, Examiners, and Investigators, Insurance Underwriters, Human Resource Specialists, Graphic Designers, and Database Administrators.

#### *1.4. Research-Based Evidence About Apprenticeships*

Although there is significant enthusiasm for apprenticeship models in the U.S. resulting in rapid growth, this modern incarnation of apprenticeship design is relatively new, and there is not much evidence that they are actually beneficial in the U.S. economic system [21]. An abundance of research exists from countries such as Germany, Switzerland, the United Kingdom, and Australia [18,22–24]. For example, Hanushek, Schwert, Woessmann, and Zhang [25] conducted a large, quasi-experimental study of the long-term effects of vocational education in 11 European countries. The study found that while participants were more likely as young people to be employed earlier in their careers than people who enrolled in general-education programs, later in life they were more likely to struggle to adapt to technological change and to maintain employment. The pattern of findings was most pronounced in countries that emphasize apprenticeship programs, including Germany, Denmark, and Switzerland. So even in the countries with long-established apprenticeship programs, the research is inconclusive on the long-term benefits to the participants.

In the U.S., one study of Registered Apprenticeship programs found a positive correlation between program participation and higher earnings; however, the findings were unable to distinguish whether or not the apprenticeship itself caused the higher wages or if it was the characteristics of the participants [26].

Otherwise, most literature in the last five years is based on Department of Labor statistical analysis or policy recommendations for increasing apprenticeship adoptions [15,18]. Presently, one of the most frequently cited publications on the subject is a study commissioned by the Harvard Business School's Managing the Future Work Project and Burning Glass Technologies, a labor market analytics company, which found that the number of occupations that commonly use apprenticeships could be expanded from 27 to 74 [15]. This study is backed by data analytics from the Department of Labor statistics and not corroborated by other research methodologies. Similarly, the Urban Institute conducted research on STEM education and apprenticeships based on statistical analysis making the case for increasing apprenticeship program implementation [15]. Finally, Craig and Bewick [18] arrive at five policy recommendations in favor of apprenticeship program expansion based on their research of economic data. In most cases, the literature appears to be operating from the viewpoint of the employers and policymakers.

#### *1.5. Defining CTE*

Career and Technical Education (CTE), once called vocational education, best aligns with the middle-skill pathways as it encapsulates most types of training short of a bachelor's degree that leads to a job requiring the use of a technically trained skill in a variety of industries such as healthcare, skilled trades, information technology, and hospitality. This training may occur at the high school, post-secondary or apprenticeship levels, and usually results in a nationally recognized certification, licensure credential or an associate degree [14]. The CTE coursework has historically used hands-on teaching and learning methods that may require equipment and laboratory settings only available at the school's facilities.

Translating these components into a learned skill set uniquely qualifies graduates for the growing sectors of the economy in STEM: Science, Technology, Engineering and Math [27].

CTE traces its roots on the secondary educational level due to its origins as an alternative to traditional high school as a Vocational-Technical (Vo-Tech) school.

Vo-Tech's came into existence in 1917, when the Smith-Hughes Act became the first law to authorize federal funding for vocational education programs in U.S. schools [28]. It established vocational education as an acceptable training option for high school students who did not need a college degree to do their jobs, such as welders, electricians, plumbers, mechanics, and factory workers. They completed their training in focused vocational programs [29]. This alternative training bred a long history of tracking minority and low-income students away from a college preparatory curriculum and into a vocational technical path. This method of classifying students created a second-class stereotype around CTE, greatly stigmatizing such programs in the U.S. and discouraged good students from taking such classes [30]. Beginning in 1990's, the Perkins act sought to reconcile many of these issues and reinvent the stigmatized 'vo-tech' as Career and Technical Education [28].

### *1.6. Drawbacks of Apprenticeship—The Case for Higher Ed Alignment*

With much of the policymakers' focus on the legislation, funding, and government agency oversight of apprenticeships, little research exists examining whether these changes will result in increased youth interest in pursuing this newly reinvigorated training model. Even with strong government and industry support, very little has been done to measure the perceptions, needs and preferences of the general public who would be at the heart of participating in this program. New America efforted to begin closing this gap in the literature. In a 2017 report, New America in conjunction with Lake Research Partners surveyed over 1000 adults nationwide to study the public's attitudes toward an apprenticeship. Snell, Voss, and Kline [31] found that Americans view public education favorably with public four-year colleges, community colleges and apprenticeships receiving the highest favorability percentages, and for-profit colleges receiving favorable responses albeit with lower intensity. However, this study went on to find a disconnect in the mindset of the respondents. While respondents indicated that they felt that apprenticeship is the best way to prepare for a career, almost half would not recommend it to a friend or family member, choosing the four-year college pathway instead.

New America continued their research to gain a more in-depth understanding of this disconnect between viewing apprenticeships favorably but an unwillingness to recommend participation in them. In a December 2017 report, New America published the findings of a focus group study where it was found that older generations associated apprenticeships with blue-collar professions while younger generations thought of it as white-collar. Both generations were more likely to embrace apprenticeship if provided a clear pathway to earning a post-secondary degree. Furthermore, they liked that apprenticeship provided experiential work-based learning opportunities and made higher education affordable and relevant.

However, they are concerned that apprenticeship would be extremely limiting to their upward mobility. The issues that caused concern included "credits may not transfer," or "the number and type of fields were too narrow [31]."

These two studies are the only two widely available reports that address the perceptions of the prospective apprenticeship population. This gap in the literature is concerning because, after all, the stated motivation for expanding the apprenticeship offerings is to improve economic mobility for the disadvantaged young adult workforce [10]. A four-year college degree has been ingrained as the gateway to a secure future [2]. Simply because there is bipartisan backing in Washington D.C. does not mean that college-bound high school student will suddenly change the course of his or her career planning. It is crucial that the design of this initiative keeps the priorities of the apprentice in the forefront ahead of those of the businesses and the politicians. Policymakers must be cautious about growing the designs intelligently in a way that allows for career path growth and flexibility for the apprentice [27].

A drawback of apprenticeship training is that participants develop a narrow cluster of industry or company specific non-transferable specialized skills, which could be a deterrent to future students [15]. In a technology-based economy, a worker's skills can quickly become obsolete, so an effective

apprenticeship program should teach transferable skills that have a broad appeal toward building sustainable career pathways for journeyman technicians [27]. Research suggests that ‘best practice’ designs involve soft skill training in the areas of communication, customer service, critical thinking and troubleshoot techniques [22,24,32].

However, no longitudinal studies have been found that research the long-term effects of an apprenticeship career path on lifetime earnings and skill attainment.

Research suggests that participation in CTE can improve students’ employment outcomes [23,30]. Furthermore, studies found that associate’s degrees and other post-secondary certificates are linked to increased lifetime earnings and career growth [22,30]. On the other hand, evidence concerning alternative career pathways provided by work-based learning models which encompass apprenticeships is lacking [21]. Rigorous studies using a variety of research methodologies to provide evidence of short and long-term advantages, disadvantages and best practices are essential to guide the evolution of this renewed method of occupational training.

These studies should be designed to analyze all stakeholders in the apprenticeships model: employer, apprentice, educational provider and policymaker.

A downside to apprenticeship participation is the job-specific nature of the training. In many cases, these skills cannot be transferred to other career paths, which may leave potential apprentices to hesitate to commit to this new initiative.

New America’s Mary Alice McCarthy made the case that “to make the most of apprenticeship, policymakers must make it part of—not an ‘alternative’ to—higher education [18].” Programs like the Registered Apprenticeship College Consortium provide a pathway for apprenticeship curriculums to incorporate credit-based coursework for their Related Technical Instruction (RTI) requirement. These accredited college credits would then be earned throughout the duration of the apprenticeship and become the property of the student [27]. The degreed apprenticeship option creates incentives to both parties involved. For example, the appeal to the apprentice is a tuition-free incentive to earn while they learn, and the employer is incentivized by gaining a loyal and committed employee who is training on the most contemporary technologies relevant to his or her position with the company. As it stands now, the RTI condition for the Registered Apprenticeship qualification is extremely flexible. The only requirement is that the RTI meets a baseline requirement of 144 h annually; however, the training can be conducted in-house, online or in a classroom [20]. How and with whom the training is conducted is left entirely up to the employer. If employers choose to embrace and credit backed curriculum, the appeal to the general public would be far superior.

## 2. Materials and Methods

Compared to other sectors of higher education where 2 million new students enroll in community college every year, apprenticeship in the United States has not grown proportionally to other educational pathways. In 2016, only around 500,000 people were enrolled in the Registered Apprenticeship system [33]. The number of apprentices pales in comparison to the number of students enrolled in college. Part of the reason for this disparity is the failure of apprenticeship to connect to the higher education system. This has meant that successful apprentices do not have access to the degrees that are necessary to advance in most careers. In fact, outside of the skilled trades, career advancement in the United States increasingly requires an associate’s or bachelor’s degree which only colleges and universities can award [34].

Given that new apprenticeship program implementations have been slower than anticipated, there are several challenges that policymakers, employers and program participants must overcome if the goal of 5 million new apprentices by 2022 is to be realized [15]. Most of the policymakers’ focus is on the businesses’ motivation to accept apprentices into their workforce and implement this method of training. However, the motivation of the potential apprentice must also be considered. With associate’s degrees experiencing a 83% increase, technical college students enrolled in two-year specialized associate degrees are best aligned with the workforce growth and occupations that leverage apprenticeship as

a possible training method. A review of the literature revealed a paucity of information regarding the perceptions of the potential student apprentices who might be participating in this program's expansion. The possibility exists that policymaker and educators alike could be building a system that nobody wants. This concern led to the research question of this study:

What are the perceptions of the selected CTE two-year associate degree college students regarding the interest, requirements, and structure of an apprenticeship?

### 2.1. Methodology

If apprenticeship expansion is going to be successful, then policymakers, educators, and businesses are to be accountable for implementing program reforms that have evidence for improving participant achievement. It is therefore imperative for educational researchers to address this lack of empirical evidence. This study was considered as exploratory research. Babbie reported that:

Exploratory studies are most typically done for three purposes: (1) to satisfy the researcher's curiosity and desire for better understanding, (2) to test the feasibility of undertaking a more extensive study, and (3) to develop the methods to be employed in a subsequent study [35] (p. 90).

Vogt says, "exploratory research looks for patterns, ideas, or hypotheses, rather than research that tries to test or confirm hypothesis" [36] (p. 105). The focus of this study was to provide initial insight and baseline data on the perceptions of students who would or could have considered apprenticeship training as a pathway for their future.

The target population consisted of CTE Associate Degree Technical College students from a system-wide Mid-Atlantic technical college. Students enrolled in an associate degree program were selected. A convenience sampling was used to select sixty-seven ( $N = 67$ ) post-secondary CTE students from four campuses located in Western Pennsylvania and Northcentral West Virginia in the U.S. Vogt stated "that convenience sampling involves a sample of subjects selected for a study not because they are representative but because it is convenient to use them" [36] (p. 57).

Based upon the review of literature, a researcher-created instrument was developed to collect data for this study, and available measures were adapted when possible. Prior to survey administration, a pilot test of item content was conducted among two full-time staff members (content validity) of the technical school's campus-based program and two student interns (language accessibility).

### 2.2. Research Design

Several survey iterations were done to reduce the length of the survey. Prior research working with college student samples suggests that shorter duration (e.g., less than 13 min for online survey completion time) results in a higher response rate [37]. All quantitative sections used a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), unless otherwise noted. The survey had three sections: a demographic section with four questions regarding gender, age, number of years of college experience, and field of study; a quantitative section with eight questions using a 5-point Likert scale; and another section with one open-ended question, which is qualitative in nature. The question for the latter section prompted students to describe suggestions that they think would improve the appeal of apprenticeships to prospective college-age students. The survey was sent via email to the approximately 500 students using the SurveyMonkey.

## 3. Results

The results were derived from both quantitative and qualitative measures. The survey collected data relative to technical college students' perceptions of the prospects of pursuing an apprenticeship as a viable post-secondary career training pathway. Qualitative data was collected via open-ended questions. Due to the nature of confidentiality, no respondents identifying information was included.

### 3.1. Demographic Characteristics of Respondents

The majority of the respondents were female (67.1%) with an age range of 18 to 24 years (56.7%). The rest ranged in age 25 to 34 (22.39%), 35 to 44 (17.9%), and 45–54 (2.9%). In terms of educational level attained, respondents ranged from completing their high school diploma or GED (26.9%) to having one year of college education (22.4%), having two years of college education (12%), three years of college education (15%) to graduate from another college (18%) to attending graduate school (6%).

Figure 1 shows the age range of the respondents:

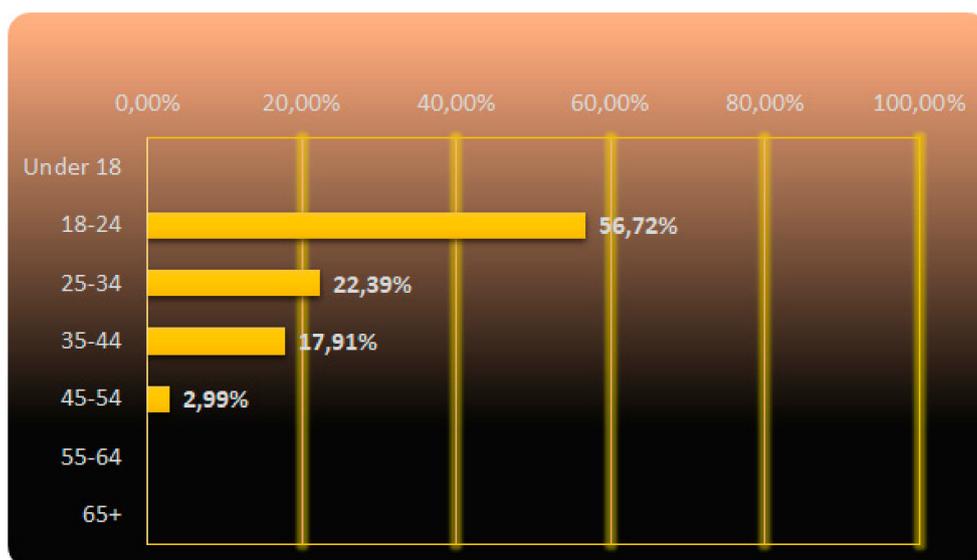


Figure 1. Age range of the respondents in the target population.

### 3.2. Summary of Results

The survey results revealed a strong interest in apprenticeships as a viable career pathway, but that several factors played a significant role in the decision-making process. Although there is some ambiguity as to whether there would be an interest immediately following high school graduation (18-year-old), the respondents indicated that they had a strong interest in balancing the rigors of full-time apprenticeship work and education requirements. The factors that have the greatest impact on the decision would be the ability to earn a tuition free education, the ability to transfer employers, and the desire to be evaluated on-the-job based on 403 competencies rather than time or seniority.

**Perceptions of Selected Career and Technical Education Students.** Table 1 shows the means and standard deviations for eight statements regarding selected post-secondary CTE students' perceptions of apprenticeship opportunities.

**All Career Options Were Presented Without Bias.** Almost a third of respondents (31.35%) disagreed that their options beyond high school were presented equally without bias.

**Ability to Transfer Credits and Earned Competencies.** Over three-fourths of participants (77.6%) felt that the ability to transfer credits and competencies earned during their apprenticeship to be an important factor in choosing whether or not to pursue this pathway. Furthermore, this question elicited the highest mean score (3.96) and one of the lowest standard deviations (.85), which indicates this is one category with unanimous support.

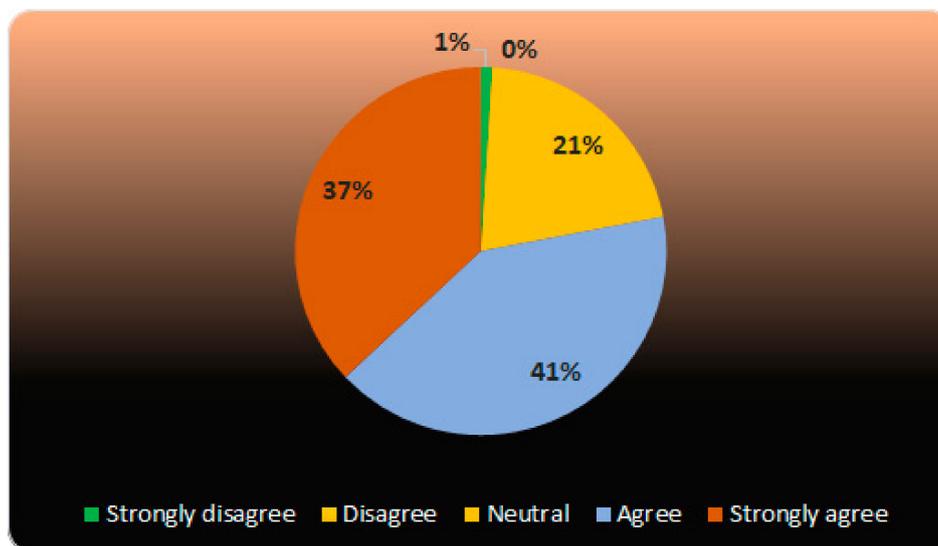
**Interest in maintaining both full-time work and school schedules.** Over half (53.7%) supported the notion of going to work and school upon graduating high school, this finding suggests that even at a young age of 18 the majority felt they would be ready for the rigors of apprenticeship schedule obligations. This sentiment was reinforced in the next question with nearly two-thirds (65.67%) neither disagreed nor strongly disagreed with the statement: 'Upon graduating high school, I would have

been prepared to make a 3–5-year commitment to an employer by entering into an apprenticeship agreement.’

**Tuition-free education.** In response to the question as to whether or not paid, tuition played an important factor in choosing apprenticeship as a viable pathway an overwhelming 79.1% agreed or strongly agreed. Figure 2 illustrates below this breakdown. Only one respondent disagreed with the question.

**Table 1.** Means and standard deviations for student responses to survey questions.

Perceptions of Apprenticeship	Mean	St. Dev.
1. Throughout high school, all of my career options including work, military, college, apprenticeship, and technical education were presented to me without stigmatization or bias from my parents and high school educators.	3.15	1.31
2. The ability to transfer my credits and earned competencies is an important factor when considering an apprenticeship.	3.96	0.85
3. Upon graduating high school, I would have been interested in managing a full-time job and college classes in my desired field of study.	3.46	1.20
4. Upon graduating high school, I would have been prepared to make a 3–5-year commitment to an employer by entering into an apprenticeship agreement.	3.13	1.10
5. Being able to earn a degree, tuition-free, from an accredited institution is an important factor when considering whether or not to pursue apprenticeship.	4.09	0.81
6. The ability to transfer from one employer to another or have the ability to terminate my apprenticeship is important factor when considering whether or not to pursue apprenticeship.	3.72	0.83
7. I would prefer to have my education and the on-the-job training occur separately during the apprenticeship.	3.13	0.91
8. I would prefer to have apprenticeship completion be measured by my skills and abilities(competencies) rather than be solely based on the amount of time logged.	3.96	0.74



**Figure 2.** Distribution of responses for tuition payments influencing apprenticeship decision making.

**Ability to change employers.** Only four responding students disagreed with the idea that the ability to change employers was an important factor in their decision-making process when considering apprenticeship pathways

**Education and On-the-Job Training separation.** Almost half (46.2%) of replies to this question were neutral leaving the researcher to infer that a large portion did not understand the concepts of Related Technical Instruction requirements.

**Competency-based On-the-Job Training.** Only one participant disagreed with the idea that they would like their training based on competencies rather than time. This question logged the smallest standard deviation of 0.74 on a mean of 3.96, which indicates a strong agreement with competency measures over a pure time-based program.

#### 4. Discussion

While most recruitment advertising efforts and grant funding are directed at the employers, the results of this study show that we cannot forget about those participating in apprenticeship programs. A major finding from this study which is consistent with previous research is the idea of creating a 'degreed apprenticeship' or 'student-apprentice' pathway [31]. Respondents unanimously supported the idea of apprenticeship if it meant they could have a transferable degree at an affordable price. The notion of being able to earn while they learn at an affordable cost appears to be something that would be highly motivating to prospective apprenticeship participants. Furthermore, they seemed willing to accept more responsibility of balancing work and school if it meant they could earn tuition-free education. However, the time-based requirement of apprenticeships received some pushback as respondents indicated a strong desire to be evaluated on their skill proficiency rather than being time logged.

#### 5. Qualitative Findings

The survey open-ended items allowed respondents to reveal their thoughts on issues related to specific suggestions for improving interest level in apprenticeship participation. The data revealed the following three themes:

- improved awareness and involvement;
- remove stigmatization of post-secondary options; and
- affordable education.

The survey gathered 45 open-responses.

Figure 3 displays above the frequencies of the themes represented that were associated with the students' responses. The frequencies total more than 45 because there were cases when different parts of a students' response were associated with more than one category.

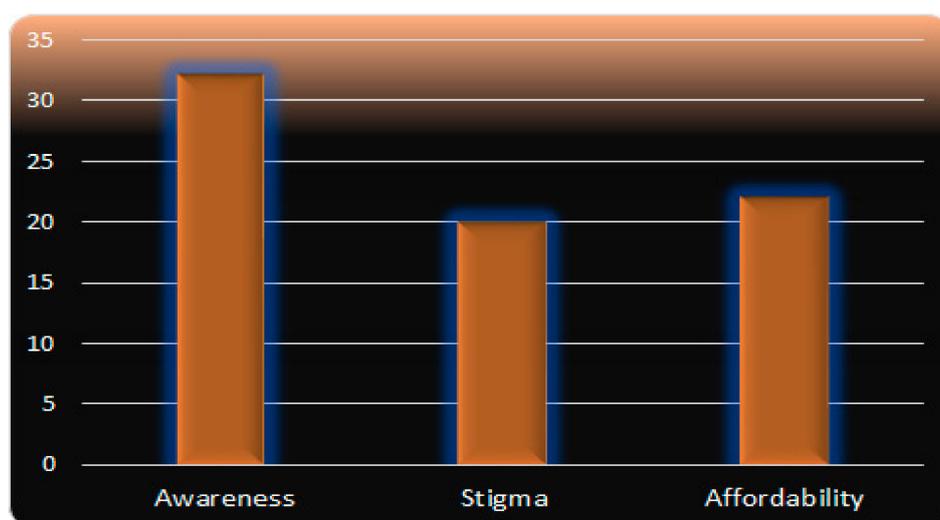


Figure 3. Frequencies of qualitative themes.

## 6. Theme 1: Improved Awareness and Involvement

Theme 1, *Improved Awareness and Involvement* was evident in the respondents' answers: 30/45 open-ended responses mentioned ways in which schools could help students engage more readily in the apprenticeships available at their institutions. Participants' comments dealt with better awareness and publicity of Apprenticeship and CTE educational offerings as a viable career pathway. Most ( $n = 45$ ) seemed to be largely unaware of the benefits available to them. This includes better promotion and advertising, improved information sharing with students and parents, presentation of choices, and support from family and schools. One respondent stated, "Mention the choice of apprenticeship. Never knew it was a thing." This is evident when examining career readiness by some researchers. Spokane [38] found that the developmental approach to career readiness emphasizes outcomes such as career planning skills, which informs students' ability to make decisions about future careers choices. This developmental approach fits into the idea of helping young adults make informed choices about what they ultimately want to pursue as careers. Likewise, adult involvement in helping students make career decisions is an important component of helping students' awareness of opportunities. Another respondent said, "Telling students about it while in high school." The involvement of adults, whether it is parents or school administrators and/or instructors, seems to be the answer. According to Metheny, McWhirter, and O'Neil, teacher support may play a "small but important role in adolescent career development" [39] (p. 220). Although research is limited on the impact teachers have on students' career choice, it is evident there is an effect "perhaps even more so than more traditional sources of social support such as peers and parents" [40] (p. 275).

## 7. Theme 2: Remove the Stigma

Theme 2, *Remove the Stigma*, was clear in the response data: 20/45 responses indicated that post-secondary options that did not include a traditional four-year college education were given less support by guidance counselors and parents. While going to college is still an excellent career path, it is not the only path. These open-ended responses corroborated the data gathered from the quantitative response where almost a third of respondents (31.35%) disagreed that their options beyond high school were presented equally without bias. One respondent elaborated on this thought by stating "I feel when I was in high school, we were never made aware of apprenticeships or technical schools, high schools push bachelor programs rather than tech schools. So the information needs to be put in high schools." Another participant continued stated, "A lot of times they (trades/apprenticeships) are presented as a fallback for an academic career. Also expanding the information and options available to high school students . . ." A 2016 report from the Educational Policy and Research Center supports these sentiments with study findings that say parents who expect their children to attend postsecondary CTE training find their schools as less likely to provide enough information on college or vocational school. Meanwhile about 77% of parents of students in grades nine or higher, who expect a bachelor's degree for their children, think that schools provide enough information [41] (p. 2). The report further discusses the stigma that continues to exist with CTE education, stating that Career and technical education suffers to a significant extent an "image" problem among many students and their parents, and even many educators. Too often, they consider career and technical education as being of insufficient quality or relevance for the vast majority of students. This feeling is astutely echoed by a respondent: "I believe there is a stigmatism that all high school graduates need to attend a college or university to be a successful person in society. We should end that and show that there are other options that are just as successful or valuable such as trades, military or personal business ownership . . . I believe parents and society need to change their thinking and portray trades and manufacturing jobs as successful as they do college degrees. Many students today feel pressured into college if we can end that I believe more students will seek out trades as after graduation options."

### 8. Theme 3: Affordability

Theme 3 centered around the notion of affordability as it relates to the cost of education. Apprenticeship agreements offer the prospect of employer-paid tuition for completion of professional certificates, associate's or bachelor's degrees all while earning a wage for on-the-job employment training. U.S. Debt Statistics states 44.2 million Americans have 1.44 trillion in US student loan debt [42]. The average monthly student loan payment for a borrower aged 20 to 30 years old is \$351. Student loan debt is \$620 billion more than credit card debt. These figures are startling, especially as one realizes that 33% of the current jobs available require four-year degrees. A 2018 study found that parents and students are beginning to recognize that one can succeed without going to a four-year institution and accumulating a great deal of debt [43] (p. 91). The financial aspect of this arrangement is an important factor in 22/45 of the responses. One respondent stated "It would be important to understand the opportunity to not start your life off in debt. You could see the value of starting a life in an in-demand field with a higher income potential vs. a student load-ridden life." In a series of other shorter responses, students reiterated the financial impacts "Tuition reimbursement, credits for prior job-related experience, paid on the job training, free college, and health benefits." These statements are consistent with study findings from a 2017 New America Foundation in where participants stated: "They liked that it was a postsecondary experience that was affordable and relevant to the job market [31]."

### 9. Early Exposure

While not a theme across multiple responses, one outlier comment offered an interesting suggestion for giving students early exposure to their potential workplace to establish the right fit for their future career choice. The researcher chose to include this response as it could provide input on future studies. The respondent said, "The ability to have a short-term contract at the beginning would be helpful because when most people graduate high school, they are still trying to determine the right field for their careers. There are people who think they have a passion for a certain field and then once in it decide that it is not a good fit for them. I would not want a 3–5-year contract with an employer if I decide I don't enjoy the field or if you get an employer that your personalities clash with. Having short term options would help sell the apprenticeship to me." Boudreau and Marx found that early exposure to work experiences in a student's field of study leads to greater persistence and better alignment into appropriate majors [44].

### 10. Limitations of the Study

It is acknowledged that this study has a number of limitations, not the least of which is that it has been conducted in a single institution utilizing a convenience sample and thus the findings may only be interpreted within that context. This, however, was offset by the utilization of an entire system of technical college students and a large sample size, thereby increasing the likelihood of a representative sample from the student population. Furthermore, the questionnaire would benefit from robust testing of the instrument to establish not just content, but also to construct validity.

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