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EXPANDING OCCUPATIONS THROUGH COMMUNITY COLLEGE REGISTERED APPRENTICESHIPS

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DEDICATION

This dissertation is dedicated to my parents, Bill and June. As first-generation college students they understood the value of education, they paved and supported this opportunity for their family which has passed to many generations.

To my children, Alicia, Andrea, Ryan, and sons-in-law, Jeff and Ron, who were my support and encouragement in so many ways, and so many times. I would not have survived these last years without all of you.

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To the American Association of Community Colleges, who allowed me to use the data from the ECCA initiative. The work done through this initiative will impact the role and value on the expansion of apprenticeships across the nation through community colleges and offer a career opportunity to thousands of students.

To my SCC cohort friends, Cristen and Laura. We spent endless hours these last three years, working and laughing together. I would not have completed, had it not been for your encouragement and friendship.

To my committee member Dr. Anne Leland, who I have always viewed as a mentor and friend. Dr. Rebecca Lake, the committee member whom I call the "Grandma of Apprentices". In my professional role and through this doctoral journey she challenged me, supported me, and mentored me, and became my friend. Her leadership on the expansion of registered apprenticeship program within community colleges, has influenced the opportunity for so many individuals and institutions.

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ABSTRACT

Registered apprenticeships remain a key workforce strategy as an affordable pathway to secure high paying jobs and meet the changing labor market demands. Individuals who have gone through a registered apprenticeship program receive substantially higher earnings, have higher completion rates, most graduate debt free and have very high job placement rates upon completion. Yet most apprentice programs have not advanced beyond the traditional occupations (construction and advanced manufacturing), and a majority of apprentices are white males.

Community colleges have existing relationships with industry and are already central to the nation's career and technical education which required applied learning that could easily be expanded on. Community colleges have impacted the growth of diverse populations and are well established to increase diversity in an apprenticeship program. Community colleges can serve apprenticeship programs in several ways, including being a direct training provider, and in some instances a register apprenticeship sponsor. Colleges as sponsors can provide the needed support to both apprentices and industry to be successful. Registered apprenticeship programs demonstrate a valuable academic pathway, meet needs of students and industry, and provide positive result for colleges.

This study utilized a quantitative causal-comparative research design which measured the expansion of registered apprenticeship occupations when community college can be registered apprenticeship sponsors. It examined if the expansion of these occupations increases the number of women and diverse populations in registered apprenticeship programs. The primary data collected and used for the study came from the American Association of Community Colleges, Expanding Community College Apprenticeships Initiative.

The finding of the study demonstrated that non-sponsor community colleges had a more diversified pool of occupations. Non-sponsor community colleges also had a higher level of expansion in women, and there was not a significant difference among diverse populations across all groups. These results imply that community colleges through strong administrative support need to build in flexibility to provide innovative pathways for all students to not just enter career pathways, but occupations driven by strong industry relationships meeting today's skills gap. Colleges also need to do a better job in identifying the disparities that exist in women and diverse populations entering registered apprenticeship programs and expand on the support and wrap-around services that are so effective in recruiting and retaining diverse populations.

Key Terms: Registered Apprenticeships, Registered Apprentice Sponsorship Status, Registered Apprentice Community Colleges Sponsorship, Applied Learning, U.S. Department of Labor Office of Apprenticeships, State Apprenticeship Agencies, Career and Technical Education, Related Training Instruction (RTI), On-The-Job Training.

CHAPTER ONE

INTRODUCTION

Even in a robust economy, Registered Apprenticeship Programs continue to evolve to meet the needs of tomorrow's economy. In 2019, sixty percent of jobs in the U.S. required post-secondary education (Torpey, 2017), and registered apprenticeships were identified as a successful pathway to those positions. These include jobs, not only in construction but also in occupations such as a medical assistant or an auto mechanic technician. As stated by the U.S. Department of Labor (2020), apprenticeships are industry driven to meet today's workforce demands and provide apprentices the ability to earn wages while receiving technical instruction for high-skill, high-demand jobs. Majority of the registered apprenticeship programs are focused traditional occupations, such as manufacturing and construction, but more recently there has been expansion across more nontraditional occupations (Shaw et al., 2019). Community colleges are poised to be leaders in the expansion of registered apprenticeship programs and occupations, because community colleges serve the communities in which they reside, and they design work-based training programs to meet local industry needs. Meeting those needs demanded expansion into different occupations beyond construction and the trades, including occupations such as healthcare and technology. This occupation expansion, partnered with the average diverse student population of over 56% (AACC, 2020) which encompasses most community colleges, provides a greater opportunity to people who are underrepresented (Dimeny et al., 2019). This study addressed the gap in literature by investigating the impact of community colleges being sponsors of Registered Apprenticeship Programs, a vital factor in the diversification of the workforce and in meeting the needs of the colleges.

Brief Literature Review

Apprenticeships are an employer-driven, "*learn while you earn*" model that combines On-The-Job Training (OJT) (minimum of 2000 hour per year), which is provided by the employer who hires the apprentices, combined with a minimum of 144 hours of Related Instructional Training (RTI) per year (U.S. Department of Labor, 2020). Related instruction is defined as a "form of instruction designed to provide the apprentices with the knowledge of the theoretical and technical information related to the apprentice's occupation" (Congressional Research Services, 2019, p.2). The RTI can be provided by a postsecondary institution such as a community college, directly by the apprenticeship sponsor, or through another provider such as a trade school, and it can be in a classroom setting or through an online platform in a synchronized or asynchronized format. Once apprentices move through the entire training which can vary from no less than one year or up to six years, they will receive from the U.S. Department of Labor (DOL) a nationally recognized certification. The benefits of this type of OJT strategy are that the process allows for flexibility to meet the needs of industry and the apprentice. The apprentice can be a new hire or an existing incumbent worker who may need to upskill their training needs. The registered apprenticeship workforce training programs are known to be rigorous because of the combination of work-based learning that is overseen by a mentor, combined with related instruction. A mentor is a subject matter expert, and many times work one to one with the apprentice during their OJT. What separates a Registered Apprenticeship Program from other work-based learning models are five components which are required as part of the training program in order to registered with the Department of Labor (U.S. Department of Labor, 2020):

- Paid Job – earn as you learn model, with a guaranteed wage increase as the apprentice gains experience and knowledge throughout their OJT experience

- On-the-Job Training – gain workplace-relevant skills in the field
- Related Training Instruction – receive classroom instruction that is directly related to the field with possible academic credit toward a college degree, which is dependent on who is providing the RTI
- Mentorship - learn skills directly from highly skilled mentors or a subject matter expert
- Nationally Recognized Credential – receive an DOL recognized industry and nationally portable credential

The history of Registered Apprenticeship Programs started centuries ago in America. Wisconsin created the first state Registered Apprenticeship system in 1911 and in 1937 the first National Apprenticeship Act (50 Stat.664; 29 U.S.C.50) was passed by Congress (History and Fitzgerald Act, 1932). Back then, and into the year 2000, Registered Apprenticeship Programs consisted mainly within the DOL identified sectors of construction such as pipefitting and plumbing, and in manufacturing such as metalworking and industrial maintenance. Following WWII, there began an expansion of Registered Apprenticeship Programs into other industry sectors, but growth really did not happen until around 2008, when the Employment and Training Administration (ETA) issued revised regulations that increase program flexibility (U.S. Department of Labor, 2018). This flexibility included expansion beyond the occupations related to construction and manufacturing which predominately attracted White middle-class males. The flexibility also expanded on who could be sponsors, which today include community colleges, industry, union and community-based organizations and associations. The flexibility also moved from a strictly time-based model to hybrid and competency-based models which assisted in the role out and the expansion into new sectors such as healthcare, culinary and business and finance. The expansion beyond construction and manufacturing, as described by the ETA in

2008, would also better serve the needs of today's apprentices and to increase programs to serve women, disadvantaged populations, veterans, the disabled, and incarcerated individuals (U.S. Department of Labor, 2020).

During President Obama's administration, apprenticeships were a workforce priority and in 2015 he pledged to double the number of registered apprenticeships within five years, a growth from 380,000 (FY 2014) to over 760,000 by 2020 (U.S. Department of Labor, 2020). In order to achieve this growth, his administration invested more than $200 million into apprenticeship grant opportunities for expansion (Klor de Alva & Schneider, 2018). President Trump in 2017, declared the goal of providing education and training to more than one million apprentices in five years through an appropriation of over $200 million, specifically for apprenticeships to assist in the achievement in closing the workforce skills-gap (Klor de Alva & Schneider, 2018). On February 17, 2021, the Biden Administration released a statement supporting a jobs bill that would create nearly 2 million new apprenticeship opportunities and $100 million dollars to support the growth and development of these programs.

In 2015, the Office of Apprenticeship created the Registered Apprenticeship College Consortium (RACC), run by the U.S Department of Labor and the U.S. Department of Education (Registered Apprenticeship-College Consortium, n.d.). The consortium members included a network of colleges who became sponsors of registered apprenticeship programs. The overall goal of RACC was to align several existing registered apprenticeship training programs to existing college programs to expand into career pathways. This program helped expand the relationship of community colleges with existing registered apprenticeship programs to provide a career pathway and an opportunity for apprentices to be granted not only an apprentice national credential, but the opportunity to also earn an academic credential (Registered Apprenticeship-

College Consortium, n.d.). Community colleges are natural partners to expand apprenticeships because they exist within the communities they serve and are the premier workforce and training providers delivering work-based skills led by industry demand, thus they are fundamental assets in workforce and economic development. Community colleges serve a very diverse population which include a large proportion of minority, first-generation, low-income, and adult learners (AACC, 2020). Community colleges also provide pathways to earning academic credentials, create new pipelines of registered apprenticeship occupations, can recruit apprentices from more diverse populations which reflect their student body, and they provide support services which influence the increase in completion and graduations rates (Klor de Alva & Schneider, 2018).

Diversity is an integral element for ensuring an equitable workforce. To ensure apprenticeship programs serve all individuals irrespective of the groups to which they belong, it is important that they support admission to a diverse student body that will ensure the necessary skills for earning high wages.

Even today during a world pandemic, apprenticeship programs will be a first responder to economic recovery by helping to solve the opportunity gap and the ability to reskill American workers as we emerge from the COVID crisis (Consumer Technology Association, 2021). Their ability to fill positions and train while on the job will create an atmosphere of placing people to work where needed. Apprenticeships are recognized as the most cost-effective way to create new career pathways which address new economic growth (Dimeny et al., 2019), making them a model that can move the economy forward as it starts to reopen.

Statement of the Problem

For decades apprenticeships have been demonstrated to the be "gold standard" of work-based training (Reed et al., 2012). Registered Apprenticeship Programs are formal work-based training programs where students are paid while being trained on the job by an experienced worker or mentor. The apprentice also receives related training typically provided by a training institute such as a community college or a trade organization. In early years, especially following World War II and into the mid-1980s, construction companies and the trade unions were the training sites for registered apprentice programs (Dimeny et al., 2019). Registered apprentices when they enrolled into this type of educational or "vocational" training, understood they were entering a respected occupation which had hands on learning components that would lead to an occupation and a job (Christman, 2012). During the mid-20th century, the reputation of registered apprenticeships shifted. According to Christman (2021), by the mid-20th century what was then deemed as "vocation education, became known as the second-tier or remedial track for students deemed less intelligent and non-college bound" (p.23). This is about the time that trade unions started to become the primary sponsor of registered apprenticeship programs and vocational training moved out of community colleges. Today, registered apprenticeship programs known as the "*earn and learn*" model have expanded into occupations outside of the construction and manufacturing sectors and align with the expansion of career and technical education (CTE) programs.

Before the pandemic, even as early as February 2019, unemployment was at an all-time low 3.5% (United States Unemployment Rate, 2020), industry in partnership with educational institutions needed to fill jobs to meet the growing "skills gap" with an increase to focus training in the areas of science, technology, and math (STEM) in order to address and prepare for the

future workforce demand (Spiker, 2019). The U.S. Department of Labor had estimated that there were seven (7) million job openings in America, and only 6.1 million available workers to fill those jobs (Torpey, 2017). The distribution of the labor funds released by both Presidents Obama and Trump, were targeted to prepare individuals for these high-skilled, high demand, positions to help meet workforce needs.

Two-year public institutions were already central to the nation's career and technical education system, granting hundreds of thousands of occupation certificates and degrees (AACC, 2020). In fact, Jobs for the Future (JFF), a national nonprofit organization which helps drive change in the American workforce and education system through research, policy, and awareness, conducted a study that demonstrated career and technical education can become the next best thing in high school reform (Browning & Nickoli, 2017). It was during this time that an increase of community colleges involvement in registered apprenticeship programs occurred, a strategy that became available through an increase of targeted funding through the Department of Labor and guidance from the RACC (Registered Apprenticeship-College Consortium, n.d.). Through this targeted funding and guidance from RACC, community colleges were able to connect to the national apprenticeship system which led to the expansion of their involvement in apprenticeship programing, building the necessary relationships with the workforce system and industry partners to help drive the education to meet the workforce "skills-gap" (Browning & Nickoli, 2017). These partnerships expanded apprenticeship programs within community colleges and opened the door and opportunity for college students to become apprentices. The expansion of this model of training, offered colleges the ability to align the curriculum with existing career and technical programs thus creating stackable credentials and career pathways which would lead to academic credentials (Lerman, 2009).

From 2013 to 2018, the growth of registered apprenticeship numbers increased by 56% and over 10,800 new registered apprenticeship programs were created (U.S. Department of Labor, 2018). Part of that growth can be tied back to the funding by the U.S. Department of Labor's, Trade Adjustment Assistance Community College and Career Training (TAACCCT), which was a major investment to increase the ability of community colleges to address workforce challenges. Under TAACCCT, every state received funding for four years through 256 grants totaling $1.9 billion (U.S. Department of Labor, 2020).

In Minnesota under their TAACCCT grant, sixteen colleges-built relationships with over 550 industry partners throughout the state. In addition, working with their state legislators helped develop and advance legislation to increase the support of apprenticeship programing (U.S. Department of Labor, 2020). Through TAACCCT funding, many community colleges throughout the nation became part of the solution to meet the workforce demands by working directly with industry to create and expand apprenticeship programs which directly addressed the skills gap facing companies. Because community colleges serve the communities in which they reside, they have the ability to design work-based training programs to meet local industry needs. Meeting those needs included expansion into different occupations beyond construction and the trades, including occupations such as healthcare and informational technology (IT). This occupation expansion, along with community college diverse student body, provided a greater opportunity to people who were underrepresented (Dimeny et al., 2019). Community colleges, because of their mission based on supply and demand to meet local workforce needs, have the ability to redesign and restructure curriculum and career pathways. Taking into account the average community college student body of which 56% are from a diverse background (AACC, 2020), faculty and instructional designers must understand the specific needs of their current

students and new opportunities to address those needs, such as competency-based curricula and hands on learning, to help meet the learning needs of all students and to help move the field of cross-cultural instructional design (ID) forward (Tracey & Unger, 2012). In fact, in 2017 and 2018 at least 17 states enacted legislation to increase the awareness of Career and Technical Education (CTE) programs and provided support and options which assisted students into seeking these pathways as a possible educational pathway (Keily, 2019). The table below compares the alignment of apprenticeship programs with CTE education which have many similarities, each with classroom-based learning and work-based experience, with technical training becoming more advanced to prepare individuals for a career.

Table 1.1.

Comparing Apprenticeship and Career and Technical Education

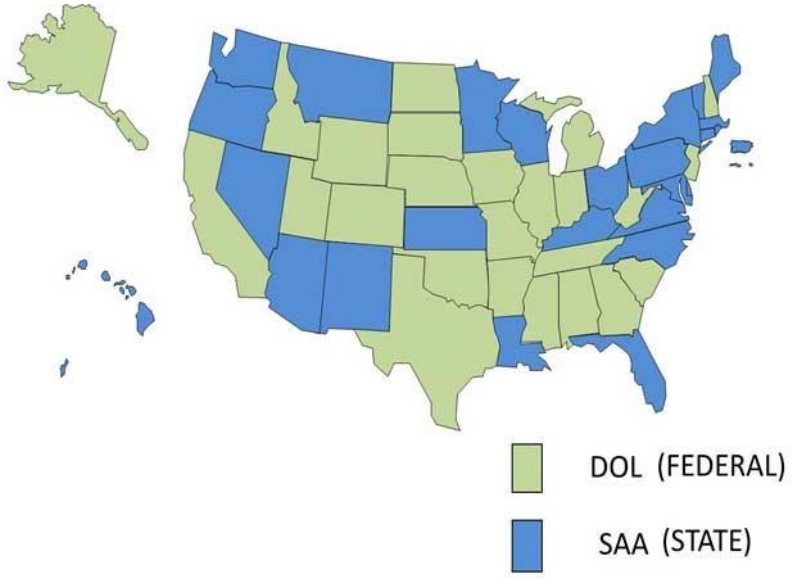
Program Components	Apprenticeship	Career and Technical Education
Hands – On Experience	Yes	Yes
Structured on-the-job training (internship or externship)	Yes	Sometimes
Earning while learning	Yes	No
Work-based & classroom learning	Yes	Yes
Full-time employment upon completion	Yes	No
Strong professional mentoring, coaching or advising	Yes	Yes
Improved employability and interpersonal skills or soft skills	Yes	Yes
Associates degree	Sometimes	Sometimes
Nationally recognized industry credential	Yes	Sometimes
Student debt for training experience upon completion	No	Sometimes

Source: Dimney et al., 2019 p.83

One of the components of a registered apprenticeship program is that they all must have a sponsor. As determined by the U.S. Department of Labor, a sponsor is any employer, a group of employers, an industry association, committee, or organization who assumes the full responsibility for the administration and operation of an apprenticeship program (U.S. Department of Labor, 2020). The role of the sponsor includes the development of the structured standards that include the requirements for the related training instruction and paid on-the-job learning. Sponsors also register their program standards and the apprentice with the Office of Apprenticeship (OA) or a State Apprenticeship Agency (SAA). They also develop an apprenticeship agreement which is signed and agreed upon by the sponsor, the apprentice, and the industry partner (U.S. Department of Labor, 2020). The ability for community colleges to be sponsors of Registered Apprenticeship Programs is not permissible in some states. In fact, close to half of the states and territories Registered Apprenticeship Programs are under the federal government through the U.S. Department of Labor, Office of Apprenticeship (OA), and the remaining twenty-eight (28) states and territories are run by State Apprenticeship Agencies (SAA). A SAA is a recognized state apprenticeship agency who can register individual programs that meet federal standards, and they can issue certificates of completion to apprentices who complete their registered apprenticeship program (U.S. Department of Labor, 2020). If a state elects to establish an SAA, the SAA must be approved by the federal Department of Labor every five years. The SAA is responsible for registering programs that meet federal standards, but the oversight of the programs is at the state level (U.S. Department of Labor, 2020). Additionally, the SAA can determine the qualification for sponsorship.

Figure 1.1.

Federal Office of Apprenticeship (OA) States vs. State Apprenticeship Agencies (SAA)



Source: U.S. Department of Labor, 2020

Community colleges as sponsors play an integral role through recruitment, selection, and preparation of students for an apprenticeship program. As part of their normal delivery, colleges offer wrap around services to their student body, including remedial courses (usually math and English courses that close the skills gap between what a student knows and what they should know to be successful in college), and soft skills or life learning courses. Colleges also offer personal and academic counseling, all of which demonstrate an increase of skills for students related to communication, teamwork, and work-readiness (Klor de Alva & Schneider, 2018). These are services that community colleges currently offer which increase the success of students and most employers are not able to offer these types of services (Klor de Alva & Schneider, 2018). As a sponsor, colleges can create a cohort of small to medium size employers by serving several apprentices under one program which makes it cost effective for those businesses (Dimeny et al., 2019). For example, Grand Rapids Community College in Michigan

works with three different healthcare facilities where they are able to provide the same related training, this allows the college to fill a cohort which is cost effective for college while taking away the pressure of the industry partner to create their own related training program for each apprentice they hire. It also allows the industry partner to only hire the number of apprentices they need, which makes it more cost effective for them. Colleges are also able to leverage funding to support apprenticeship programs through various federal agencies such as the U.S. Department of Labor, U. S. Department of Education, and the National Science Foundation, to name a few. Colleges also have other streams of funding available to students, including Title IV funding, which provides financial aid to students attending accredited postsecondary institutions (Klor de Alva & Schneider, 2018). These funds can cover all or most of the costs related to the apprentice training including tuition, fees, books, transportation, and other supplies. Below is a list of federal grants that were available for colleges to apply, which supported the development and implementation of registered apprenticeship programs from 2015 through 2019.

Table 1.2.

U.S. Department of Labor Grants that Support State Apprenticeship Expansion, 2015-2019

Grant Name and Purpose	Year	Amount	Funded
American Apprenticeship Initiative. These grants fund partnerships between employers, organized labor, nonprofits, local governments, and educational institutions to expand registered apprenticeship to new communities and new industries.	2015	$175 Million	9 States (46 grants)
Apprenticeship Accelerator Grants. These grants allow states to develop a strategic plan and build partnerships for apprenticeship expansion and diversification with state education, workforce, and economic development systems.	2015	$104 Million	50 states and DC
State Apprenticeship Expansion Grants. These grants support integrated, statewide apprenticeship strategies and state capacity to engage industry and meet the demand for new programs in both traditional and nontraditional industries and catalyze state innovations to increase apprenticeship opportunities for low-income and underrepresented populations.	2016 &18	$100.5 million	37 States
Apprenticeship State Expansion Grants. These grants expand the number of apprentices in registered apprenticeships nationwide, encourage apprenticeship diversification, including increasing the diversity of apprentices and growing apprenticeship across industry sectors; and support the integration of registered apprenticeship into state workforce development, education, and economic development strategies and programs.	2019	$73 million	57 States

Community colleges are central to how this nation delivers its career and technical education. In 2016, community colleges across the nation granted over 1,519,311 certificates and degrees in fields such as healthcare, manufacturing, informational technology, and other career technical fields (AACC, 2020). With regulations that support community colleges to be involved and sponsor registered apprenticeship programs, combined with financial incentives, and alignment with existing career and technical education, along with the diversity of their student population, community colleges can be the lynchpin to the expansion of registered apprenticeship occupations. Colleges can also expand and support the expansion of diverse populations including women because they serve the most non-White students (58%), attract adult learners (51%), and serve a substantial number of students with disabilities (12%) (AACC, 2020).

Purpose of the Study

The world of apprenticeships is evolving not only to meet the demands of the workforce system, but to meet the needs of adult learners today in our society. New partners have been invited into the registered apprenticeship arena, one being community colleges. As natural partners, they already have the cornerstone on working with their local industry partners and provide training and educational credentials in technical education to over 11.8 million students (AACC, 2020). Since 2014, there has been a vast growth of colleges who are involved in apprenticeships and have taken on new roles related to apprenticeships beyond just providing related instruction (Browning & Nickoli, 2017). Community colleges have impacted the growth of diverse populations attending post-secondary education and are expanding occupations in nontraditional occupations such as healthcare, IT and business and finance. As of 2019, it was noted that at a minimum of 350 colleges were registered apprenticeship sponsors (Registered

Apprenticeship-College Consortium, n.d.). This is a significant growth from 2014 where there were very few mainly due to the lack of fiscal and government support.

Because community colleges already provide training in several different sector occupations and in career and technical education, they are well established to expand apprenticeships into nontraditional programs by repacking many existing academic programs and by aligning or cross walking their curriculum with industry standards of registered apprenticeship programs. In 2017, Jobs for the Future surveyed the 350 colleges that were part of the U.S. Department of Labor, Registered Apprenticeship College Consortium (RACC), and found that over seventy-five percent of the respondents expressed interest in exploring emerging fields with the purpose of creating new apprenticeship programs in new industry sectors (Browning & Nickoli, 2017).

Community colleges are well established to increase the diversity in apprenticeship programs. For instance, Anne Arundel Community College located in Maryland created a landscaping registered apprenticeship program, 70% of the students that enrolled in this new occupation are of Hispanic descent. Community colleges serve a high percent of non-White students (56%) and they also attract adult learners which are students above the age of 22 (44%) (AACC, 2020). In fact, the average age of a community college student is 28, and part-time students account for 65% of the overall student population. Of the full-time students that attend 2-year institutions, 62% of them are also working (AACC, 2020). Given these facts, a "*earn and learn"* model would fit the needs of most students who attend community colleges. A diverse student population combined with several sector-based technical training programs; community colleges can increase the number of underrepresented groups into the workforce. Colleges also have established long standing relationships with their local Workforce Innovation and

Opportunity Act (WIOA) office and one-stop job placement centers, as well as other non-profit or community-based organizations, so they are well poised to reach underrepresented populations (Workforce Development Agency, 2014).

The purpose of this study was to determine the effect community colleges who are eligible to become sponsors have on the growth and expansion of registered apprenticeship occupations and the people who become an apprentice, specifically an increase in the diversification of the population. Rationale for conducting this study was to explore the value of community colleges as sponsors to those states who have not expanded the role of sponsorships beyond industry associations or trade unions. The researcher posited that the results of the study would provide evidence that the relationship between utilizing community colleges as valuable sponsors would help meet the needs of those small and medium size employers, who do not have the capacity to become their own sponsors to expand occupations and fill positions to meet workforce needs (Dimeny et al., 2019). The study would help to clarify the benefit of having post-secondary education institutions as sponsors who provide paths of opportunity for all student to learn and earn to help meet the needs of today's students.

Hypotheses, Research Questions and Variables

$H0_1$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H1_1$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H0_2$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

$H1_2$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

This study's research questions are as follows:

1. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?

2. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?

As noted early there are some states in which community colleges can become registered apprenticeship sponsors under the U.S. Department of Labor's Office of Apprenticeship (OA) or with a State Apprenticeship Agency (SAA) (U.S. Department of Labor, 2020). Of the total 106 colleges that are working with the American Association of Community Colleges (AACC) Expanding Community College Apprenticeships (ECCA) initiative, less than half of them are actual sponsors for apprenticeship programs. Colleges that are not sponsors are still involved in apprenticeships by offering the related training instruction for industry partners, labor unions, or other eligible entities. Community colleges have in a short time been able to demonstrate the value they bring to registered apprenticeship programs, but few studies and few documented efforts have been established on a national level to track these benefits (MacGregor, 2019). There are several states that can demonstrate the increase in women, especially as it relates to

expansion of apprentices into traditional occupations such as healthcare and business, but they are also seeing an increase in women in the non-traditional occupations of construction and manufacturing. To the fact that career and technical training programs are becoming more popular in community colleges and more women are entering the workforce, they see these technical positions as high wage positions they could pursue. The increase in diverse populations and women coincides with the expansion of registered apprenticeship occupations, which attract more students to industries such as insurance, finance, IT, and child-care.

Definition of Main Variables

The following variables of the study include:

1. Registered Apprenticeship Program Sponsor: Sponsors are responsible for creating and expanding new apprenticeship occupations. This study measured the difference between the ability of community colleges as sponsors to expand into non-traditional occupations (Shaw et al., 2019).
2. Registered Apprentice Occupation: Registered apprenticeship occupations are identified through an O*NET Code which is the 8-digit code that identifies a specific occupation (www.onetonline.org). This study measured the expansion of non-traditional occupations beyond the construction and trades (Kuehn, 2019; Monthey, 2019).

Demographic Variables

- Gender: as referenced in this study is defined as the range of characteristics pertaining to and differentiating between male and females and the challenges related to apprenticeship programs faced by women included low wages and low rates of recruitment (Dalporto & Tesssler, 2020). This was measured through information entered into the database on each apprentice.

- Race and Ethnicity: There are disparities related to the number of Whites and diverse populations who have entered apprenticeship programs (Hanks et al., 2018). In this study race and ethnicity were aligned with the definitions used by the U.S. Department of Labor (U.S. Department of Labor, 2020). All apprentices were asked to self-identify, and this information is uploaded into the database.

It was not within the scope of this study to include the completion rates, or the degrees or certificates received by the apprentices who were part of the study. It was assumed that if a college is involved, it is most likely that the RTI would be aligned to a certificate or academic degree (Browning & Nickoli, 2017). This then demonstrated the value of higher education in the work-based learning strategy of not just training for the jobs for today, but for those of tomorrow. According to the U.S. Department of Labor (2021), completion rates of students who enroll and complete a registered apprenticeship program is 97%.

It was assumed that if the results of this study provide enough supportive data to substantiate the conceptual assumption that community colleges who are sponsors have the ability to expand registered apprenticeship occupations into non-traditional sectors, then apprenticeship proponents and supporters would be equipped with convincing evidence that could be provided to the Federal Office of Apprenticeships and State Apprenticeship Agencies to support all colleges to be sponsors regardless of the state they reside. The SAA is responsible for registering programs that meet federal standards, but the oversight of the programs is at the state level (U.S. Department of Labor, 2020). Additionally, the SAA can determine the qualification for sponsorship and intermediaries.

It is important to note terms and how they are defined by the U.S. Department of Labor in relation to Registered Apprenticeship Programs (2020).

***Apprenticeship*:** A proven approach for preparing workers for jobs while meeting the needs of business for a highly skilled workforce. It is an employer-driven, "learn-while-you-earn" model that combines on-the-job training, provided by the employer that hires the apprentice, with job related instruction in curricula tied to the attainment of national skills standards. The model also involves progressive increases in an apprentice's skills and wages.

***Earn and Learn*:** Any training and education model in which the student/employee is earning a wage at the same time they are learning in a curriculum aligned with that occupation.

***Journeyman/Journey Worker*:** A person who learns a work-based skill under a federal or state registered apprenticeship program.

Nationally Recognized Credential: Every graduate of an Apprenticeship Program receives a nationally recognized credential. This is a portable credential that signifies to employers that apprentices are fully qualified for the job.

On-the-Job Learning (OJL): Apprenticeships always include an on-the-job training component. Apprentices receive hands-on training from an experienced mentor at the job site. On-the-job training focuses on the skills and knowledge an apprentice must learn during the program to be fully proficient on the job. This training is based on national industry standards, customized to the needs of the employer.

Program Sponsor/Sponsor/Sponsorship: The sponsor is responsible for the overall operation of the program. Sponsors can be a single business or a consortium of businesses. They can also be a range of workforce intermediaries, including an industry

association or a joint labor management organization. Community colleges and community-based organizations can also serve as sponsors for Apprenticeship Programs. Regardless of who serves as the sponsor, apprenticeships are always employer-driven, and employers are involved throughout the process.

***Registered Apprenticeship*:** Apprenticeship is an industry-driven, high-quality career pathway where employers can develop and prepare their future workforce and individuals can obtain paid work experience, classroom instruction, and a portable, nationally recognized credential.

Related Technical Instruction (RTI): One of the unique aspects of apprenticeships is that they combine on-the-job learning with related instruction on the technical and academic competencies that apply to the job. Education partners collaborate with business to develop the curriculum, which often incorporates established national-level skill standards. The related instruction may be provided by community colleges, technical schools, or apprenticeship training schools – or by the business itself. It can be delivered at a school, online, or at the job site.

***Standards/Program Standards**:* Registration means the program has met national and independent standards for quality and rigor. Registration tells prospective employees, customers, and suppliers that the business invests in its workforce and believes employees are its most important asset.

Significance of the Study

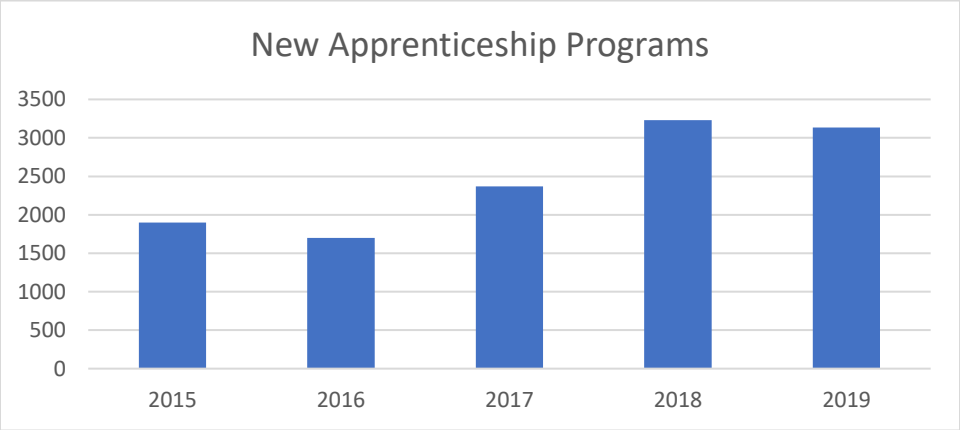
In 2017, Registered Apprenticeship celebrated its 80th anniversary. In that same year President Trump signed an executive order expanding apprenticeships in America, with the goal

of providing education and training to more than one million apprentices in the next five years (U.S. Department of Labor, 2020). President Trump supported this goal through appropriations of over $200 million specifically for apprenticeship programs to help close the skills-gap (Klor de Alva & Schneider, 2018). This increase in federal funding with a direct focus on workforce demonstrates the changing labor market demand for a skilled workforce and the need to expand registered apprenticeships as a work-based learning model. Registered Apprenticeship Programs remain a key workforce development strategy as an affordable pathway to secure high paying jobs (Dimeny et al. 2019).

Registered apprenticeship programs are keeping pace with innovation and technology to meet the changing needs of employers and workers. There is a demonstrated growth in new apprentices, 128% since 2009, which accounts for over 705,000 new apprentices since 2009, along with 12,300 new apprenticeship programs that have been created in the last five years (U.S. Department of Labor, 2018). While there has been an increase in apprenticeship programs and apprentices since 2013, apprentices still only make up less than 4% of the American workforce. Figure 1.2 demonstrates the growth of new apprenticeship programs over a five-year period.

Figure 1.2.

Growth of New Apprenticeship Programs

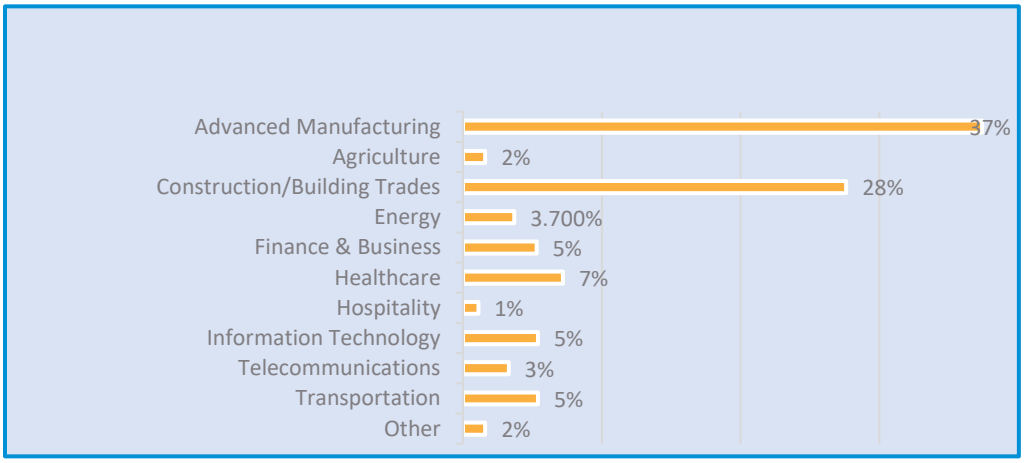


Source: U.S. Department of Labor, 2020

Currently, apprenticeship opportunities are available in more than 1,000 occupations as documented through the U.S. Department of Labor (2020). Apprenticeship programs now include such occupations as truck driver, child-care worker, nursing aids, banking, and finance. Even with this growth, 65% of the registered apprenticeship programs are still in construction and trade professions as demonstrated in Figure 1.3.

Figure 1.3.

Industry Sectors of Registered Apprenticeship Programs



Source: U.S. Department of Labor, 2020

In a study which looked at the Return on Investment (ROI) for apprentices who completed the program and went right into the workforce, apprentice earnings demonstrate an average pay range of $114,029 more earned during a 9-year period compare with those that did not go through an apprenticeship training program (Hollenbeck & Wei-Jang, 2006). Individuals who have gone through a registered apprenticeship program receive substantially higher earnings as demonstrated above, usually graduate debt free because tuition is usually covered by the employer, and 97% are retained and placed in a permanent job upon completion (Reed et al., 2018). Registered Apprenticeship Programs utilizing certificates or credit-bearing courses as the related instruction part of their training demonstrates a valuable academic pathway to meet the needs of the student, industry, and provides positive results for the colleges (Lerman, 2009).

In the past, the most common role for community colleges working with registered apprenticeship programs was to provide the related instruction, but community colleges sponsoring registered apprenticeship programs almost unheard of a few years ago, are now becoming more common. Today, more and more community colleges are becoming sponsors for registered apprenticeship programs across the country.

Research Ethics

Permission and IRB Approval. This study was approved through the Institutional Review Board (IRB) of Minnesota State University Moorhead (MSUM). See Appendix A. for the MSUM IRB approval form. This approval was completed before the handling of data and successfully met the requirements to ensure the ethical conduct of research involving human subjects (Mills & Gay, 2019). This study conducted secondary data analysis, no direct contact with human participants was required.

Informed Consent. Likewise, authorization to conduct this study by using American Association of Community Colleges existing data accumulated through the Expanding Community College Apprenticeships Initiative was granted by the American Association of Community Colleges (AACC) organization. See Appendix B. for the signed letter from the President and CEO of AACC.

Delimitation and Limitations of the Study

There are a several limitations related to this study. The ECCA Initiatives timeline is short-term which may not be sufficient for all the colleges involved to be able to register all their new programs and occupations. The timeline included data that were collected during the ECCA initiative which was a three-year project. New Registered Apprenticeship Programs take a large amount of time to design and implement, and there are several stages of approval the new program must go through within the college and the Department of Labor. The processes include a number of steps such as: (1) partnership development with industry partners, (2) determining the training competencies required to perform the skills for the occupation, (3) the writing of the related instruction and the work-processes, (4) approval from the college internal curriculum committee and (5) external approval on the new standards by the U.S. Department of Labor. This process varies from college to college and state to state, to stand up a new apprenticeship program on average as we are learning through the ECCA Initiative takes anywhere from six months to one year.

The pool of colleges involved in the study accounts for less than 10% of the public two-year institutions within the United States, they represent colleges across the nation including 31 state and territories. The colleges were chosen through an application RFP process through AACC. The study does not include any non-public or four-year institutions. The location of the

colleges may have affected the study based on the number of colleges who reside in an OA state and those that are in SAA states. The location could also have affected the population of employers that are in the region in which the college serves. And lastly, student populations may vary greatly depending on the location of the college (urban vs. rural) and the amount and type of student population they serve.

Conclusion

Information in this chapter described the basic foundations of the study to include the explanation of a Registered Apprentice, the role of community colleges related to workforce development, and their role related to Registered Apprenticeship Programs. The chapter covered the history of Registered Apprenticeships in America and the value they bring to industry and workforce development. This chapter demonstrated the value community colleges bring to our communities related to working with industry partners to help meet workforce demands and how they serve a large number of diverse students because of their location and their ability to provide the supportive services necessary for underrepresented populations to be successful in post-secondary education. It also covers the expansion of Career and Technical Education (CTE) programs within community colleges and the alignment of CTE with registered apprentices. The chapter also describes the data used for this quantitative study, the limitations of the study, and the primary and secondary research questions along with the variables that were used in the study.

The next chapter will include the literary review presenting a conceptual overview of the history, growth and value of registered apprenticeships, and their role in meeting todays workforce skills-gap. It will also look at the value of community colleges and the role they play in the expansion of CTE programming, and how adapting the alignment of apprenticeships

through higher education transformation can be a strong workforce strategy. Through expansion of these workforce training strategies, community colleges are well established to expand diversity, equity and inclusion. Lastly, the chapter includes the theoretical framework, purpose of the study, as well as the evaluation criteria, existing gaps in research and the rationale for the study.

CHAPTER TWO
LITERATURE REVIEW

Apprenticeships are a work-based training strategy where students are paid while being trained on the job by an experienced mentor, this work-based strategy is also known as the "*earn and learn*" model. Before the pandemic, when unemployment was at an all-time low 3.5% (United States Unemployment Rate, 2020), there was a push to train individuals to meet the growing skills gap and the need for a focus on high-demand and high-skilled training in order to address and prepare for the future workforce demand (Spiker, 2019). The distribution of the labor funds released by both Presidents Obama and Trump were targeted to prepare individuals for these skilled positions meeting workforce by using registered apprenticeship programs to meet the workforce skills-gap.

There is an increase of community college involvement in registered apprenticeship programs, a strategy that became available through U.S. Department of Labor (DOL) funding which mainly started in 2014 through the release of Trade Adjustment Agreement Community College and Career Training grants (TAACCCT) and guidance from the RACC (Registered Apprenticeship-College Consortium, n.d.). Community colleges are part of the solution to meet workforce demands because they can create apprenticeship programs that can help address the skills gap facing most companies, and they can also provide greater opportunity to people such as underrepresented populations (Dimeny et al., 2019). Colleges have the ability to redesign interventions and structure pathways which can serve all students, focusing on providing appropriate support services to disadvantaged or first-time students. Curriculum designers must embrace the constraints and the opportunities to move the field of cross-cultural instructional design (ID) forward (Tracey & Unger, 2012). In 2017 and 2018, at least 17 states enacted legislation to increase the awareness of Career and Technical Education (CTE) programs and

provided support and options to assisting students into seeking these options as a viable educational pathway (Keily, 2019). Community colleges are central to how this nation delivers CTE and Registered Apprenticeship Programs and can play a major role in meeting the skills gap that exists today in the USA. CTE programs are central to the expansion of apprenticeships as both are industry driven to meet the demands of today's workforce, but apprenticeships take CTE programs one step further through a direct relationship with industry offering an OTJ component. With the right regulations and incentives, community colleges are the key to the success and can expand registered apprenticeship occupations, thereby presenting an opportunity to increase the rates of underrepresented populations (e.g., culturally diverse and women).

The ability for community colleges to be sponsors for Registered Apprenticeship Programs is not permissible in some states, depending on the regulations as set forth by each state independently. Half of the state Registered Apprenticeship Programs are run under the federal government through the U.S. Department of Labor, Office of Apprenticeship (OA), and the remaining twenty-eight (28) states or territories are run by State Apprenticeship Agencies (SAA). Community colleges as sponsors play an integral role, through recruitment, selection and preparation of students for the apprenticeship experience. As sponsors they can create a cohort of small (less than 100) to medium size (100 – 999) employers by serving several apprentices under one program which makes it cost effective for those businesses who are only able to train one to two apprentices at any given time (Dimeny et al., 2019).

Community colleges have impacted the growth of diverse populations attending post-secondary education and are expanding apprenticeships in nontraditional occupations which we are seeing through the Expanding Community College Apprenticeship (ECCA) initiative. With a demand from diverse student populations combined with several sector-based technical training

programs; community colleges can increase the number of underrepresented groups into the workforce.

The purpose of this study was to determine whether by allowing community colleges to be sponsoring agencies of Registered Apprenticeship Programs there is an impact in the expansion of apprenticeship occupations into non-traditional sectors and occupations, which in-turn impact the increase of diverse populations enrolling in apprenticeship programs. This chapter begins by presenting a conceptual overview of registered apprenticeships, their history, growth, and the value they bring to meeting the expanding workforce skills-gap. Next, the role of community colleges will be explored, their expansion of CTE programming, and the value they bring to Registered Apprenticeship Programs to meet workforce demand. The study also explored whether through transformation of higher education based on scientific data, we can better meet workforce development needs for states to remain competitive throughout the nation and globally.

Body of the Review

Literature on research conducted with apprenticeship programs was reviewed, including the historical overview of the work-based training strategy. Next, the review was organized along the variables of the study, and divided into sections on registered apprenticeship programs, community colleges, apprenticeship programs and student diversity. Finally, gaps in the literature were identified.

Historical overview. In the context of the United States, the history of apprenticeships can be traced back to the very beginning, as settlers arrived in America. In this traditional form, apprenticeship involved an agreement expanding over a particular period that trained apprentices

with an employer who in return for work, provided shelter, food, and training (Jacoby, 1991). This was the primary education model for men (Pilz, 2013). Craftsmen provided young apprentices with knowledge and skills regarding a specific trade and such a program typically had a tenure of four years, or more (Lerman & Rauner, 2011).

During the Colonial Period, the historical perspective of apprenticeships demonstrated the training program as a formal education which included not only learning work-based training skills in the trade, but also the learning of soft skills and a pathway into adulthood. During this training, apprentices understood they were entering a respected occupation which had hands on learning components leading to an occupation (Christman, 2012). Interest in apprenticeships declined throughout the modern Industrial Revolution with an increase in technology and faster production, most of the registered apprenticeship programs became less practical to employers.

With time, in order to accommodate for the requirements of the workplace and the labor market, this system went through several modifications. As industrialization and formal education increased in the nineteenth century, the old apprenticeship model declined, and development of skills began to occur mostly in the context of an educational system as part of vocational training (Pilz, 2013). Different types of apprenticeship programs existed until the early twentieth century, when apprenticeship programs were formalized through the National Apprenticeship Act of 1937 under President Franklin D. Roosevelt, which was enacted as part of the New Deal initiative, which set minimum standards (Jacoby, 1991).

Apprenticeship programs were viewed until the latter half of the twentieth century with low regard in part because of the bias that apprenticeship programs were meant for high school students who were not considered fit for college (Pilz, 2013). Alternative career paths remained underutilized well into the latter parts of the twentieth century as high school counselors,

teachers, and parents started to pressure graduates from high school to enroll in college (Lerman & Rauner, 2011). Increase in federal programs for higher education financial aid provided further impetus for students to go to college, increasing college accessibility to diverse group of students (Pilz, 2013).

Motivated by the push to go to college in the latter half of the twentieth century, the enrollment in college increased and other paths into labor market, such as apprenticeships, became less attractive (Fuller & Sigelman, 2017). Following the recession of 2008, while college attendance increased, including in community colleges, apprenticeship programs decreased (Fuller & Sigelman, 2017). Excluding military apprenticeship programs, there were approximately 12,300 registered apprenticeship programs in 2008 in the US and by 2013 that number had decreased to 8,600. While there has been an increase in apprenticeship programs and apprentices since 2013, apprentices make up less than 4 percent of the American workforce. Although more attention has been directed towards apprenticeship programs, the number of individuals who complete apprenticeship programs remains small compared to those who obtain associate degrees and bachelor's degrees, and the demographics of apprentices are predominantly White men (U.S. Department of Labor, 2020).

Recently, U.S. policymakers have begun to realize the benefits of apprenticeships (e.g., high-skilled learning, earn while you learn, meet industry needs). In 2014, the Workforce Innovation and Opportunity Act (WIOA) provided increased funding opportunities for registered apprenticeship programs to supplement their apprentice training costs (Craig & Bewick, 2017). In addition, Presidents Obama and Trump made apprenticeships a workforce priority pledging to double the number of registered apprenticeships within five years and invested more than 400 million dollars between the two administrations to accomplish the expansion (Klor de Alva &

Schneider, 2018). A recently reauthorized Perkins Act also supported apprenticeships related within CTE programming (Loudenback, 2018). The Carl D. Perkins Career and Technical Act included a 1.2-billion-dollar annual federal investment aimed at developing local and state secondary and post-secondary programs for students participating in career and technical education. The emphasis on work-based learning aligned with the Obama and Trump administration's emphasis on encouraging the use of apprenticeships (Loudenback,2018), all demonstrate support on the growth and value of registered apprenticeships. Both administrations supported the need to provide training that would meet the needs of industry in relation to high-demand and high-wage positions.

Registered Apprenticeship Programs

Registered apprenticeship programs consist of a model for learning that is work-based, enabling students with the opportunity to obtain training in skills relevant to the workplace while also receiving a paid wage (Cheney, 2017). Students who are part of apprenticeship programs are provided a paid work-based learning opportunity, along with related instructional training (Kuehn, 2019). Apprenticeship programs are distinguished from other types of programs for skill training because they are registered with the U.S. Department of Labor, the apprentice is hired by an employer, receives wage increases, and the apprentice is sponsored by an employer, intermediary or a community college that have a very structured program with a duration between one to four years (Kuehn et al., 2019). Through this system, practical courses are combined with theoretical courses in reference to a particular trade, at the end of which students obtain a nationally recognized certification and other possible industry or academic credentials (Shaw et al., 2019). Apprenticeship programs are also distinguished by the fact that students in these programs enter into a voluntary contract with a sponsor which provides information on the

type of skills in which training will be provided, the time commitment, and the amount of wage the students will earn (Sullivan, 2018). The purpose of Apprenticeship programs is to provide proficiency to the students in a particular skilled trade, establish professionalism, and obtain better prospects in their career that enable further career advancement and job placement (Monthey, 2019).

At present, the apprenticeship programs in the United States are supervised by the Department of Labor's Employment and Training Administration (Workman, 2019). The department is responsible for developing and/or approving apprenticeship program standards, tracking agencies at the state and national level and expanding registered apprenticeships (Cheney, 2017). Additionally, the department also works to supervise the practices, organization, and structure of the programs through administrative and technical assistance (Kuehn, 2019). The department is also responsible for ensuring there is no discrimination against under-represented groups, such as minorities and women, which still make up a very small percent overall of all registered apprenticeships (Kuehn et al., 2019).

The operation of the registered apprenticeship programs occurs through a wide variety of partners (Sullivan, 2018). These partners may include but not exclusive to educational institutions, such as community colleges, government institutions, trade associations, labor unions, and industry. Sponsors are those who register the apprenticeship programs and the apprentices at the relevant state and federal agencies and provide mentoring, training, tracking, and recruitment for apprentices (Monthey, 2019). In general, it is expected that apprentices finish, at a minimum, 144 hours of RTI each year, as well a minimum of 2000 hours of OJT training (U.S. Department of Labor, 2018). Some allocated states have freedom to manage the apprenticeship programs system called State Apprenticeship Agencies (SAA), although federal

authorities from the Office of Apprenticeship (OA) are responsible for the overall supervision (Workman, 2019). Consequently, the Registered Apprenticeship Programs in the United States are decentralized through varying management, tracking and administration (Kuehn et al., 2019). Majority of the registered apprenticeship programs are focused on fields considered traditional, such as manufacturing and construction, but more recently there has been expansion across more occupations (Shaw et al., 2019). While traditionally, apprenticeship programs were provided in occupations such as welding, maintenance, building ships, carpentry, electrical, emerging industries have expanded the apprenticeship programs into such areas as technology, finance, and healthcare (Kuehn, 2019; Monthey, 2019).

Components of Registered Apprenticeship Programs. The *learn while you earn* model of registered apprenticeships will always be driven by industry. One component that is necessary and consistent across all registered apprenticeship programs is that you must have an industry partner. This was developed to ensure the training was meeting workforce needs and demand. The training program is rigorous and what separates a Registered Apprenticeship Program from other work-based training strategies (e.g., internships and externships), are five components highlighted in the table below.

Table 2.1.

Five components of a registered apprenticeship

Source: U.S. Department of Labor, 2018

Five areas include:

- Paid Job – all registered apprentices must receive a salary while performing on the job, and there is a built-in wage increase as the apprentice increases their skills and competencies.
- On-the-Job Training (OJT) – at a minimum an apprentice must complete 2,000 hours a year on the job.
- Related Training Instruction (RTI) – at a minimum, an apprentice must complete 144 hours of related instruction a year.
- Mentorship – this is the key concept on the transfer of knowledge from the expert to the learner. This is a requirement in all registered apprenticeship programs.

- Nationally Recognized Credential – at the end of the program each graduate receives this portable credential that demonstrates full competency in the occupation they were trained for.

Different roles in Registered Apprenticeship Programs. Apprenticeships continue to demonstrate strong growth. Since 2014 there has been a 128% of growth, with an additional 705,000 new apprentices since the end of 2016, and 12,300 new apprenticeship programs created in the last five years (U.S. Department of Labor, 2020). Yet, the number of apprenticeships in the U.S. totals only about 4% of the eligible workforce (Decker, 2019). Registered apprenticeships still carry the reputation in many states as a representation of a skilled trades profession with union roots. Changes to WIOA, Perkins, and the millions of dollars invested into apprenticeships all assisted in the expansion of apprenticeship programs to a broader audience including community colleges (Decker, 2019).

With the expansion of Registered Apprenticeship Programs comes the ability to expand apprenticeship programs beyond the trades and manufacturing. The Consumer Technology Association (2021) released a publication which cited the need, and supported the case, to expand apprenticeship program implementation in technical occupations and an independent study done by Harvard University found the number of occupations could be expanded from 27 to 74 within a five-year period (Fuller & Sigelman, 2017).

Community College and Apprenticeship Programs

Community Colleges. Community colleges themselves did not evolve until after World War II and the passage of the G.I. Bill of Rights, which extended public education to millions of Americans (Mellow & Heelan, 2008). Today there are 1,050 community colleges who enroll

over 6.8 million students (AACC, 2020). The demographics of diverse students that attend 2-year colleges account for over 56% overall and grant over 850,000 associate degrees, 579,822 certificates and 19,083 baccalaureate degrees (AACC, 2020). To provide access to all students, two-year college tuition is kept at a lower cost rate of $3,730 versus $10,440 which is the average rate at a 4-year college (AACC, 2020). The researcher of this dissertation has experienced by working at a community college, that they survive because they are capable of rapid change, and they are learner and community based. They are also able to respond to economic needs within a community but also global in their missions embracing and reflecting the changing demographics of their community and America.

The past few years, higher education has been scrutinized on the value and the preparation it is achieving to assist students into a successful career track. The Higher Education Act (HEA) was originally signed in 1965 and was designed as a pathway for students to receive an education leading to a career, the last time it was reauthorized was in 2008 (NASFAA, 2018). Before the pandemic of 2020 there were more than 6 million unfilled jobs due to the shortage of a skilled workforce, and student debt stands at more than 1.3 trillion dollars (Craig & Bewick, 2017). College graduates who receive a 4-year degree and graduate with a bachelor's degree or higher make up 56% of the workforce population, but nearly half of the future job growth requires less than a four-year degree (Johnson & Spiker, 2018). According to a study by the National Skills Coalition, middle skill jobs account for more than 53% of the current labor market, yet just 43% of workers are trained to this level (Johnson & Spiker, 2018).

Several failed attempts to rewrite the HEA took place in 2017-2018 between both parties. Some of the reauthorized bill (the PROSPER Act) contained incentives which would support programs to bridge the skills gap and realign postsecondary education with in-demand jobs

through programs that are earn-and-learn programs, and short-term certificates (NASFAA, 2018). This would include apprenticeship programs that increase student access to high-wage, high-skill, and high-demand career paths. Through bipartisan support in 2016, the Strengthening Career and Technical Education in the 21st Center Act passed and community colleges across the nation aligned their education programs by creating stackable credential and career pathways to meet workforce needs called Career and Technical Education (CTE). Work-Based Learning (WBL), also known as *experiential learning* or *applied learning* have been incorporated by several CTE programs as part of their curriculum design (Holzer & Lerman, 2014). In post-secondary education CTE has evolved into internships, externships, clinical rotations, and apprenticeships (Decker, 2019).

Educational institutions partner with industry professionals to align on-the-job training with curriculum and instruction to fill labor shortages in high-skilled professions. Between 2016 and 2018, 30 states passed 60 new apprenticeship laws as noted by the National Conference of State Legislatures (NCSL) (Apprenticeships in k-12, n.d.). According to the NCSL, most of the passed legislation falls into five categories (2019).

- Establish new apprenticeship programs or create new requirements for existing programs. For the past three years, about half of all apprenticeship legislation was covered by this category.
- Authorize new funds for apprenticeship programs. Most of these funding bills provide tax credits, grants to employers to incentivize hiring of apprentices or scholarship funds to students who are participating in an apprenticeship program.

- Seek to address increasing awareness for available apprenticeship programs. These bills often require high school and 2-year institution counselors to include apprenticeship options that are available to students in their advising programs.
- Ensure that apprenticeship credit can be used to fulfill traditional curriculum requirements and to ensure credits transfer.
- Expand apprenticeship programs to prevent discrimination and ensure diversity among apprentice programs.

Examples of states where policies are ensuring support to higher education include:

- Connecticut SB 607 (2019) requires the Labor Department and the Board of Regents for Higher Education to jointly establish nontraditional pathways to earn a bachelor's degree through apprenticeships.
- Florida HB 577 (2018) allows students to use credits earned from a youth apprenticeship or pre-apprenticeship program to satisfy high school graduation requirements.
- Virginia SB 999 (2017) requires each comprehensive community college to develop policies and procedures for awarding academic credit to enrolled students who have successfully completed a state-approved registered apprenticeship credential.

Community Colleges and Career and Technical Education (CTE). Community colleges because of their location and relationship with the community in which they reside and their expertise in CTE training, make them prime providers of Registered Apprenticeship

Programs. Apprenticeships have been an underused training tool and few community colleges have been involved with apprenticeships before 2016 (Klor de Alva & Schneider, 2018). There are strong benefits for everyone involved in an apprenticeship program including the industry partner, students, and the colleges. Implementing registered apprenticeship programs at a college can assist in filling the college mission, build stronger relationships with industries they serve, expand into building new relationships with businesses in new sectors, increase college enrollment by serving a new population of students, increase completion rates, and increase revenue (Reed et al., 2019).

Once called vocation education, which was first invested in through the Smith-Hughes National Vocation Education Act in 1917, which is now called the Carl D. Perkins Vocation and Technical Act which was amended in 2006. The main reason for the continued support and interest in CTE is the "skills-gap" that exists, which is basically the difference between what employers need to fill in high- demand positions with a skilled workforce. By 2020, almost two-thirds of the workforce will require some postsecondary education (Carneval, Rose, Hanson, 2012). Many states are adopting measures to expand CTE courses and learning experiences. In fact, in 2017 and 2018, seventeen states passed legislation which in many instances provided support to students and colleges and increased awareness of Career and Technical Education (Keily, 2019). Many states have used this opportunity to build stronger relationships with governmental agencies, the business community and community colleges as a means to establish strong CTE work-based learning programs. Nearly two-thirds of the of the high-demand positions in the future will require a postsecondary credential (Spiker, 2019), and community colleges are directly linked to the ability to achieve this goal.

Dadgar and Trimble (2015) conducted several studies related to the value of short-term credentials and their impact on employability for students. Their study looked at the return on investment in a community college education related to three different types of community college credentials including short-term certificates, long-term, and associate degrees. They also measured each of these types of certificate trainings, and how they were directly related to the position or the skill required for the position. Dadgar and Trimble (2015) accessed student record data from a state system of community colleges in Washington, which comprised of 34 community and technical colleges, and matched with these student record data with UI employment data from the same state. The results showed that there were opportunities for increased wages for students, specifically women who achieve associate or long-term certificates. The wages were also aligned within specific sectors versus that of degree type. For instance, a woman with a long-term certificate or associate degree was found to have a 14 percent higher wage compared to men which only demonstrated a two percent increase (Dadgar & Trimble, 2015). When comparing fields of study an associate degree in nursing was found to generate a 37 percent increase versus humanities, which showed only a 3.6 percent increase.

While overall results demonstrated support that short-term training, meaning less than a four-year degree, did demonstrate a significant increase in wages depending on the field of study, it also demonstrated value to those short-term trainings as viable educational pathways to higher degrees. The ability to prove that a wage increase associated with certificates assists in proving the assumption on the value of stackable credentials as a pathway into higher levels of education and to achieving a higher level of workforce skills.

Work-based learning programs can help address the workforce demand for not only finding workers but also as it relates to building worker's skills. The significant problem is that

53% of U.S. jobs require middle skilled workers, which means they need additional training beyond high schools but not necessarily a four-year degree (Spiker, 2019). Today, there are only 43% middle skilled trained workers in the US. This limits our ability to attain economic growth and build on opportunities locally, state-wide, nationally, and globally. In the U.S. we have the people to fill these jobs, but we need a system to better train and recruit to fill this 10% gap. Work-based learning, which include on-the-job training opportunities such as apprenticeships, can bring the structured learning into the workplace to assist existing workers to upskill, and new workers to learn the skills required to meet the immediate workforce needs of our businesses.

To address these issues, the Workforce Innovation and Opportunity Act (WIOA) was researched, local communities are required to develop industry and sector-based partnerships to support workforce development plans. The industry partnerships include key stakeholders in an industry and should include partners from the small to mid-sized businesses, representatives from local workforce boards, a higher education representative, and a labor organization representative. Their purpose is to meet the industry demand of local areas and offer businesses of all sizes, and workers of all skill levels, the necessary support to take work-based learning to scale (Spiker, 2019).

Small to mid-sized business cannot afford the start-up costs of developing, implementing, and running work-based learning programs. But, through a consorted effort which includes shared funding from each of the partners, there has been an increase in work-based learning initiatives. For example, these might include tax credits and other incentives for businesses and funding from colleges through the Higher Education Act to pay for classroom instruction, and human services and career services can offset the cost of housing, transportation, and childcare. Federal policy recommendations also are targeting technical skills training programs through

grants which support the expansion of industry partnerships to increase work-based learning to scale. One example is that "congress has appropriated more than $400 million to the Department of Labor (DOL) to expand apprenticeships over the past few years" (Spiker, 2019, p.11).

Spiker (2019) interviewed several state partnerships demonstrating the successful industry partnerships' impact on the expansion of work-based learning opportunities for workers that are meeting workforce demands in the states that participated in the study. The Spiker (2019) study also demonstrated how effective the partnerships are, and described collaborative efforts between industry, education, workforce, and human service systems. This study is important as it sets up the opportunity for higher education to support the reauthorization of the Higher Education Act, which will give opportunity to enhance the educational system's capacity to partner with businesses, the workforce system, and other stakeholders through industry-based partnerships. This could then influence future federal funding and support for states to invest in local, industry-driven, partnerships to meet the increased workforce demand and skills required for our economy to be successful.

Federal and state administered apprenticeship programs. Community colleges, depending on where they are located, will determine their ability and the role they can play on the implementation of registered apprenticeships. The U.S. Department of Labor is the agency that oversees the regulations of apprentices through the Office of Apprenticeships. Twenty-six (26) states or territories fall under the guidance of the DOL Office of Apprenticeship (OA) and twenty-eight (28) states or territories have elected to develop their own State Apprenticeship Agencies (SAA), which are the regulating body for the registered apprenticeships in that state. Under these two types of regulating bodies the five training components, as noted on pages 33 and 34, are what differentiates registered apprenticeship programs from other work-based

learning programs. (e.g., internships, externships). Under the federal DOL OA regulations, community colleges can act as the related training provider, act as an intermediary, and can hold the sponsorship of a registered program. As a sponsor, community colleges operate the program and have full responsibility for the administration and operation of the Registered Apprenticeship Program (U.S. Department of Labor, 2020). On the other hand, SAA states, the regulation and policies vary depending on each state's laws and regulations related to the registered apprenticeship. In several SAA states community colleges cannot be sponsors of registered programs.

The present study was designed to compare the impact generated by apprenticeship occupations being implemented through colleges that are eligible to be sponsors to those colleges that are in SAA states and are not eligible to be sponsors. The main inquiry related to determining whether with the expansion of apprenticeships into non-traditional occupations there would also be an increase in diverse populations, such as culturally diverse individuals and women. In Reed's (2012) study, they examined if there was a pattern of differences between the registered apprenticeship programs administered by the federal office of administration (OA) and those administered by State Apprenticeship Agencies (SAA). Their findings suggested that there was no significant difference between the basic structure or overall administration of the programs, but they did find that SAA state personnel had stronger relationships with their state partners. Reed (2012) also stated that directors in SAA states had the discretion to influence state apprenticeship funding and policies related to registered apprenticeship programs in their state. The study conducted by Reed (2012) is used as a reference because it took place before the Obama and Trump administration proposed the expansion of registered apprenticeship programs.

Challenges to expansion. Despite the significant role of community colleges in the provision of Career and Technical Education, currently they do not provide an adequate number of opportunities for apprenticeship programs to be offered (Sack & Allen, 2019). However, researchers have noted that community colleges still contain the potential for the broadest expansion of apprenticeships (Klor de Alva & Schneider, 2018; O'Banion, 2019).

While community colleges provide a wide variety of courses in relation to CTE to ensure students are able to obtain training that allows them to gain employment immediately, their main role as organizations is to grant degrees (Tesfai, 2019). Community colleges obtain benefits and recognition when they enable students to graduate with a degree or when they enable students to move towards a traditional four-year education program (Sublett & Tovar, 2021). In order to expand apprenticeship programs within this environment, researchers have found that community colleges can, without altering this arrangement, enable apprenticeship programs by becoming more flexible (Stevens et al., 2015). Community colleges can allow academic credits to students who are enrolled in apprenticeship programs (Sack & Allen, 2019). By allowing the transfer of competition certificates for registered apprenticeship to college credit, community colleges can expand their apprenticeship programs to ensure more minority and underrepresented groups are allowed to take part (O'Banion, 2018; Rosen et al., 2018).

In addition to the transfer of apprenticeship experience to academic credit, community colleges can expand apprenticeship through the provision of direct training and by sponsoring registered apprenticeships (O'Banion, 2019). By collaborating with employers in their community, colleges can offer apprenticeship programs to their students (Lowry & Thomas-Anderson, 2017). Despite these possibilities, only a small number of community colleges currently take part in registered apprenticeship program as partners (Grosz et al., 2020). This gap

may be explained by the fact that apprenticeship programs involve training that primarily occurs at the workplace, not the classroom.

Gauthier, (2020). Apprenticeship programs often involve fewer hours in classroom instruction (144 minimum) compared to on-the-job training (2000 minimum) (Garza Mitchell, 2017). Thus, in order to enable the expansion of apprenticeship programs, leaders at community colleges must be supportive of training provided mainly outside of the campus structure (Cai, 2018).

There are other difficulties that may prevent community colleges from expanding apprenticeship programs (Beer, 2019). A major barrier with regards to the provision of apprenticeship programs at community colleges concerns degree program credit requirements that are not flexible (Bahr, 2017), additionally, requirements for credit completion do not align with the requirements for apprenticeship programs (Klor de Alva & Schneider, 2018). While community college preference aligns towards fields of general education, apprenticeship programs tend to be aligned towards subjects that are related directly to the on-the-job training of the apprentice (O'Banion, 2019; Stevens et al., 2015; Tesfai, 2019). Consequently, without flexibility in regard to credit, community colleges may fail to allow apprentices to benefit from college credit training (Lowry & Thomas-Anderson, 2017).

Another structural barrier to the expansion of apprenticeship programs concerns the need for community colleges to recognize the resources needed for implementing apprenticeship programs (Gauthier, 2020; Johnson & Spiker, 2018). While there are inherent attractions for students to apprenticeship programs, such as the ability for students to learn and earn, the requirements concerning commitment involving both classroom instruction and training cannot be minimized (Gauthier, 2020; Tesfai, 2019). Therefore, it is important for community colleges

to provide preparation for students for the work required in apprenticeship programs (Sack & Allen, 2019). One way to achieve this would be through orientation prior to the beginning of apprenticeship programs (Sack & Allen, 2019). However, coupled with the work required from community colleges regarding the administration processes, coordination with industries, presence of staff trained in relevant fields, and the presence of state-of-the-art instructional material, the demands from community college staff can be overwhelming, so it is important to have support from administration and at a minimum, one designated person to coordinate the effort (Johnson & Spiker, 2018; Stevens et al., 2015; Tesfai, 2019).

In addition to structural barriers to expansion of apprenticeship programs, community colleges may also experience challenges related to their local environment (Garza Mitchell, 2017). Expansion of apprenticeship programs requires collaboration with local companies (Grosz et al., 2020). Some community colleges may benefit from the presence of companies near them which are willing to participate in apprenticeship programs, community colleges which lack local industry are placed at a disadvantage (Sublett & Tovar, 2021). For community colleges to ensure successful expansion of apprenticeship programs, it is necessary to understand the organizational possibilities in their nearby environment and ensure both the desire and the capability to be responsive to the needs of employers (Lowry & Thomas-Anderson, 2017; O'Banion, 2019; Tesfai, 2019). Despite the challenges, all community colleges can achieve the opportunities related to apprenticeship programs through proper planning and research (Gauthier, 2020). For example, community colleges can focus on the needs that businesses in their communities have (Lowry & Thomas-Anderson, 2017). However, the fact remains that it is impossible for apprenticeship programs to be viable unless there is active involvement from an

employer, the provision of which continues to remain a major challenge in the expansion of apprenticeship programs at community colleges (Garza Mitchell, 2017; Tesfai, 2019).

While at present apprenticeship programs make up only a small part of the national CTE efforts, both the number of apprenticeship programs and the occupations range is expected to expand (Lowry & Thomas-Anderson, 2017). To remove barriers, leaders at community colleges play an important role (Sack & Allen, 2019). Whether a community college enables apprenticeship programs through sponsorship or by allowing external players to do it on their behalf, the role of community colleges remains that of a bridge between prospective apprentices and employers (Stevens et al., 2015). Based on recommendations from research (Sublett & Tovar, 2021), community colleges can expand apprenticeship programs by assisting in the recruitment, selection, and preparation of apprentices. Community colleges can provide further support to apprentices through the provision of personal counseling as well as career training in soft skills that may be required for workplace success, such as leadership skills, skills for working in teams, and communication skills (Garza Mitchell, 2017; Johnson & Spiker, 2018; Tesfai, 2019). Such skills are not within the capacities of the majority of employers (Sublett & Tovar, 2021). Consequently, expansion of apprenticeship programs can be attained through assisting student apprentices by mentoring them at the level of classroom instruction (Johnson & Spiker, 2018). Existing opportunities enabled by the rising interest in apprenticeship programs provide community colleges with the space for expansion through the services that address barriers to successful apprenticeship programs (Stevens et al., 2015). Thus, the need for addressing challenges that may prevent expansion of apprenticeship programs at community colleges is crucial, more studies must be conducted in order to explore this issue in more depth (Klor de Alva & Schneider, 2018).

The complexity of challenges they currently experience, community colleges remain critical in how CTE and apprenticeships are delivered in the United States (Johnson & Spiker, 2018). The majority of the certificates granted by community colleges are developed to provide training to students for jobs in diverse fields such as business, information technology, and healthcare (Tesfai, 2019). While their importance cannot be undermined, it remains true that community colleges wishing to expand their part in the delivery of apprenticeship programs must undertake the necessary changes to meet the challenges and address the barriers preventing such expansion (Lowry & Thomas-Anderson, 2017; Sack & Allen, 2019).

As a result of their important part in the provision of training to the workforce and the rising interest in apprenticeship programs, community colleges currently face the need to expand their apprenticeship programs to allow students to transition to the workplace (Beer, 2019; Johnson & Spiker, 2018). Based on the literature on ways community colleges can expand apprenticeship programs, achieving this outcome would require leadership to direct attention towards meeting the needs of both the students and the employers and make reforms at the college level to ensure sufficient flexibility in the administration of the curriculum. Consequently, ensuring that community colleges are able to remain flexible and make the necessary reforms to ensure value for students seeking transition to careers has wider significance.

Apprenticeship Programs and Diversity

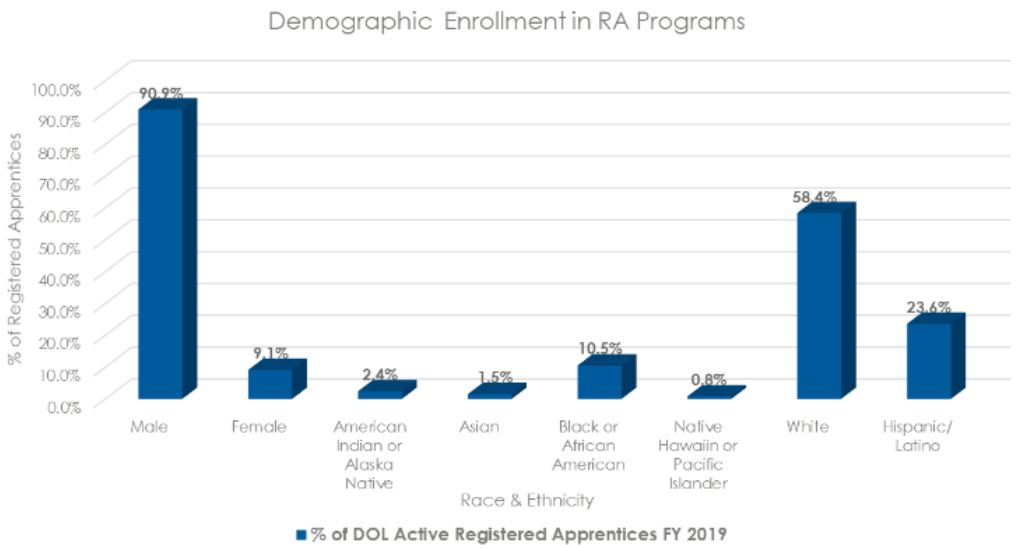
Diversity and Inclusion. There is a large growing and a diverse pool of jobs across sectors and the need for employees is short and long-term. The U.S. Department of Labor estimated that there are six (6) million job openings in American and only 6.1 million available workers (Torpey, 2017). Currently, less than 37% of the enrolled apprentices are students from

diverse backgrounds. Community colleges serve the highest number of diverse populations accounting for over 56% (AACC, 2020) of their overall student population.

Efforts to make apprenticeships equitable have a long history. In 2016, the U.S. Department of Labor released updated Equal Employment Opportunity (EEO) regulations to help businesses reach a larger and more diverse pool of workers. When everyone has the opportunity to become apprentices, all individuals who possess the full potential to provide a highly skilled workforce that pays well, are tapped into, can advance careers and help America compete in a global economy. Figure 2.1 below demonstrates the breakdown of apprentices related to gender and diversity. The numbers below represent all registered apprentices which are accurately tracked through the U.S. Department of Labor.

Figure 2.1.

Demographics of Registered Apprentices



Source: U.S. Department of Labor, 2019.

Current challenges to diversity and inclusion. Expanding the workforce to meet present economic demands is one of the major questions for policymakers (Beaudry & Perry, 2020). Although prior to the COVID-19 pandemic the unemployment rate in the United States was historically low, there were still challenges faced by workers, including the limited rise in employee wages. Additionally, income and wealth gaps based on gender and race have resulted in some groups experiencing hardships in the workforce (Turner, 2018).

Increasing income inequality as well as gaps in earning on the basis of race have continued even as gaps in higher education achievement have reduced, even African Americans obtaining a bachelor's degree have not managed to decrease the earning gap between them and Whites (Kim et al., 2021; Turner, 2018). At the same time, companies have reduced the amount of money they spend on the training of workers compared to the past (Rosen & Molina, 2019). Frequently, the training that is provided is specific to a particular organization, rather than field, as a result of which they are not easily translated to other organizations (Leu & Arbeit, 2020).

In this equation, the role of registered apprenticeship programs has been much discussed. The purpose of these programs involves forming a bridge between employees and high wage high skill jobs, with individuals from under-represented groups, such as women and minorities (Kuehn, 2017). Through apprenticeship programs, it is possible to create paths for developing economic opportunities and link individuals, who are traditionally differentiated in the workforce, with employment opportunities (Kim et al., 2021). Through work-based learning opportunities like apprenticeships, it is expected that disparities in diversity on the basis of gender and race, which extend beyond representation occupations to wage gaps and racial wealth gaps, can be reduced (Hanks et al., 2018). Even though community colleges enroll large numbers of diverse populations, studies on registered apprenticeship programs show disparities on the

basis of gender and race (Estes & McCain, 2019). Women and minorities are reported to have low recruitment rates and when they enroll in apprenticeship programs, they tend to enroll into occupations that do not provide high wages (Dalporto & Tessler, 2020).

Existing research findings suggest that there are significant disparities with respect to wages between racial and gender groups within the context of those involved in apprenticeship programs (Zessoules & Ajilore, 2018). For instance, it is found that women have a lower likelihood of taking part in apprenticeship programs (Beaudry & Perry, 2020). Additionally, women who do take part in such programs tend to earn lower wages compared to men. Reasons for such disparities vary (Turner, 2018). One of the reasons relates to the differences in the occupations that women and men most frequently enter (Conrad et al., 2020). It is noted that men have higher likelihood of taking part in relatively higher paying occupations such as that of electrician, while women have higher likelihood of taking part in relatively lower paying occupations such as child-care programs (Bragg, 2017; Turner, 2018). Other occupations that women are more likely to enter into, such as support staff in pharmacy and hospitality, also provide lower wages compared to the occupation's men are more likely to enter into (Toglia, 2020; Wolzinger & O'Lawrence, 2018). For instance, the most frequent occupations for men from apprenticeship programs such as plumbing, and carpentry pay more than the majority of the occupations for women (Kreisman & Valero, 2021). More research is needed to explore what type of programming or supports are needed to increase the enrollment of women into other occupations with registered apprenticeship programs.

Differences also extend across racial lines. For instance, even when African American apprentices work towards similar occupations as Whites, they are likely to attain lower wages compared to Whites following the completion of their apprenticeship programs (Hanks et al.,

2018; Toglia, 2020). Such differences in earnings in relation to apprenticeship programs cannot be explained through the occupations chosen alone (Leu & Arbeit, 2020). Further restraints can be identified according to region-based disparities in both apprenticeship programs involvement and earnings that may provide some explanations regarding the gaps in earnings (Hanks et al., 2018). For instance, in the United States disparities in earnings can be identified based on whether an apprentice is located in the South, Northeast, Midwest or West (Kreisman & Valero, 2021). Individuals from the western states like California who finish their apprenticeship programs are more likely to earn higher wages compared to individuals from other areas (Conrad et al., 2020). In contrast, those who complete their apprenticeship programs in some of the southern states are likely to earn the lowest wages (Beaudry & Perry, 2020). Thus, along with gender and racial disparities that are based on choice of occupations there are disparities that result from geographic concentration, which may explain some of the wage gaps identified (Zessoules & Ajilore, 2018). More research is needed to explore and compare occupations and wage gaps within geographic regions.

Based on a review of literature on apprenticeship programs and diversity, particularly in relation to gender and race, it can be noted that African Americans fare worse than other racial groups and women fare worse than men. Consequently, in order to ensure expansion of apprenticeship programs to serve a diverse population and make them more inclusive, it is important that these programs are made more accessible (Kuehn, 2017; Leu & Arbeit, 2020). To develop a workforce that is equitable, there is a need to take into consideration the subtle variances that may result in lower median earnings for individuals from underrepresented groups, such as those related to regional differences and occupation choices (Dalporto & Tessler, 2020; Kim et al., 2021). When explaining the different outcomes among racial and gender

groups, it is important to take into considerations the various ways in which gender, race, and geographical areas intersect and worsen existing disparities (Conrad et al., 2020). It can be concluded that diversity is an integral element for ensuring an equitable workforce. To ensure apprenticeship programs serve all individuals irrespective of the groups to which they belong, it is important that they facilitate the development of necessary skills for earning high wages. Other diverse populations to explore, include students with disabilities and those who are or have been incarcerated.

In addition to earning gaps, there are also gaps in program completion that may vary based on regions and across gender and racial lines. African Americans have the lowest likelihood of completing apprenticeship programs in the West, where median earnings are highest across all racial groups, and most likely to complete apprenticeship programs in the Midwest and South (Turner, 2018; Zessoules & Ajilore, 2018). With respect to other racial groups, Hispanics, Asians, and Native Americans are also most likely to complete apprenticeships in the western states (Wolzinger & O'Lawrence, 2018). In terms of gender, women have a lower likelihood in enrolling in apprenticeship programs and women make up less than 10 percent of all participants in apprenticeship programs (Hanks et al., 2018; Kuehn, 2017).

People with Disabilities. According to the Bureau of Labor Statistics (BLS) in 2015, only 17.5 percent of persons with a disability were employed. In contrast, the employment rate for those populations without a disability was 65.0 percent. Registered Apprenticeship, with its mentoring and on-the-job training components, can be a highly successful strategy to recruit, train, and retain individuals with disabilities in both traditional and other high-growth industries (U.S. Department of Labor, 2018). Providing disability services is no stranger to community colleges, currently 20% of the population served by community colleges include services for

students with disabilities. Services for students with disabilities are provided for all students qualified under the Americans with Disabilities Act (ADA) of 1990, the ADA of 2009, and Section 504 of the Rehabilitation Act of 1973, as long as they request them and are eligible for accommodations. The Office of Disability Services (ODS) located at each college is the department designated to coordinate accommodations that would allow students to have equal access and inclusion in all courses, programs, and activities at the college.

Many employers are still reluctant to hire individuals with disabilities because they lack understanding on their abilities. In addition, they have fears about their responsibilities for providing reasonable accommodations. Yet, employing people with disabilities improves an employer's bottom line by reducing recruiting and training costs because they are productive capable workers who tend to stay with their employers longer (Lindsay et al., 2018). Also, in many cases, employers can receive tax, wage subsidy, and other benefits for hiring individuals with disabilities (U.S. Department of Labor, 2020).

Students who are Incarcerated. Developing the capacity of colleges and universities to enroll students who are incarcerated, a historically underrepresented population in postsecondary programs, may aid these institutions in meeting their broader goals, but more importantly it will aid in the opportunity for these students to be given, a second chance.

Educational attainment is a barrier to employment. Individuals who are incarcerated have lower levels of educational attainment, putting them at greater risk of unemployment once they are released. “A startling 94 percent of incarcerated people have a high school diploma or less, while only 64 percent of the U.S. adult population is in the same position” (Hanks et al., 2018, p. 4). Among African Americans, this figure rises to 96 percent, and 37 percent of the U.S. adult

population holds an associate degree or higher, while only 6 percent of the incarcerated population holds the same degree (Hanks et al., 2018).

At the federal level, the U.S. Department of Education launched the Second Chance Pell Experimental Sites Initiative in 2016, a demonstration project that temporarily lifts the ban on Pell Grants for students in state and federal prisons (Hobby et.al., 2019). This initiative is allowing 67 colleges to administer federal financial aid to 11,000 students in state and federal prisons. Research suggests that prison education programs, including apprenticeships and other technical and academic programs, are successful in reducing recidivism and improving inmates' labor market outcomes post-release (Hobby et.al., 2019). The VERA Institute points out (2017), that incarcerated individuals who participated in prison education programs were 43 percent less likely to return to prison and those who participated in technical training programs were almost 30 percent more likely to be employed after release than those who did not receive training (Hobby et. al., 2019). Research demonstrates that the higher the wages earned by formerly incarcerated individuals two months post-release, the less likely it was that those individuals would return to prison eight to ten months after release (Hobby et.al., 2019).

Apprenticeships offer students who are incarcerated the opportunity to gain valuable skills and a credential that is marketable in the labor market. Apprenticeship programs allow incarcerated individuals to connect with potential employers. Because these programs offer hands on training and are designed by employers, they assist inmate apprentices to connect with outside employment opportunities even before their release. What is less well-known, is that on average, more than 8 percent of registered apprenticeship entrants each year are individuals who are currently incarcerated (McGrew and Hanks, 2017).

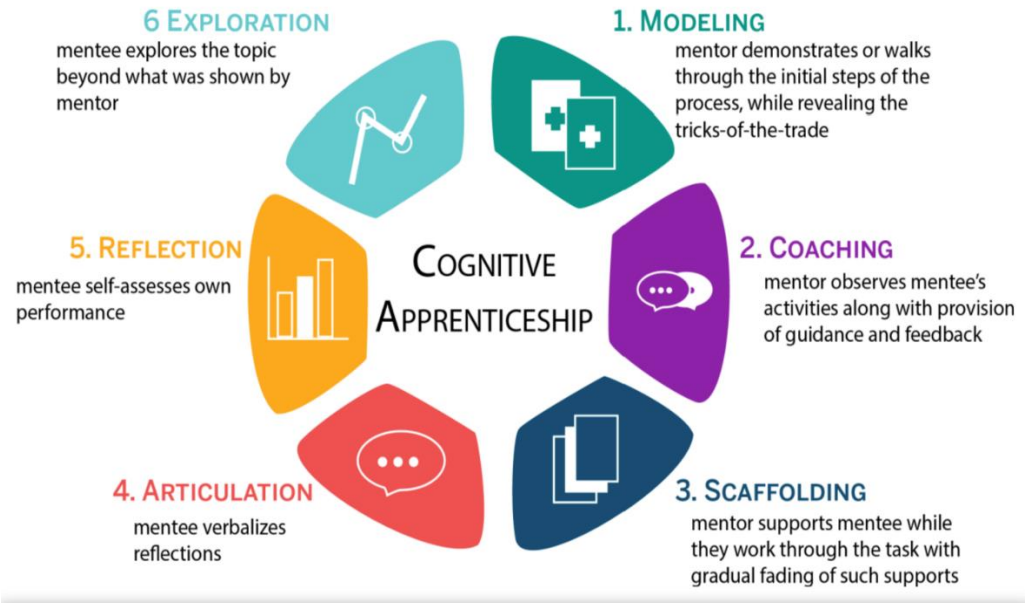
Theoretical Framework

Three theories relevant to this study: 1) Cognitive Apprenticeship Theory, 2) Theory of Change, and 3) Objective-Based Program Evaluation Model. Together, the three theories help form an appropriate theoretical framework for this study by integrating the variables of apprenticeship, expansion of apprenticeship programs, and diversity.

Cognitive Apprenticeship Theory. Cognitive apprenticeship theory is defined in terms of learning via guided experience on metacognitive and cognitive processes and skills, instead of physical processes and skills (Dennen & Burner, 2007). It originates from social learning theories (Dennen & Burner, 2008). The theory is founded on the assumption that learning is best achieved through guidance, including coaching and demonstration, provided in initial stages of learning (Lyons et al., 2016). In this model, learners are presented with tasks that are somewhat more challenging than what they are capable of solving by themselves and have to depend on help from others in a partnership to solve them (Matsuo & Tsukube, 2020). The method is aimed primarily at teaching the problem-solving processes to handle complex tasks which enable the apprentices to learn strategies and skills to solve problems (Dennen & Burner, 2007). Tasks provided as part of cognitive apprenticeship are holistic and become more diverse and complex with time as the student gains experience (Dennen & Burner, 2008). Cognitive apprenticeship provides a more refined model than traditional learning based in classroom in that it recognizes the value of expertise in practice which may not be appreciate in a lecture format (Lyons et al., 2016). Below, demonstrated in Table 2.2 is an example of the learning sequencing related to cognitive apprenticeship as demonstrated below where learners build on their skill levels and then demonstrate their knowledge (Dennen & Burner, 2007).

Table 2.2.

Cognitive Apprenticeship Model



Source: Dennen and Burner, 2007.

There are several identified themes that can be identified as its foundational principles. One of these is situated learning, which is a form of active learning which occurs through a student's participation in an authentic setting (Dennen & Burner, 2007). Through situated learning, the institutional, historical, and cultural forces that characterize the tasks of ordinary life are incorporated in learning (Dennen & Burner, 2008). It is a foundational principle of cognitive apprenticeship theory that learning takes place within an application situation have higher likelihood of resulting in practical improvement (Lyons et al., 2016). Another principle is that of legitimate peripheral participation, when a student begins learning as part of cognitive apprenticeship, his role is that of observer, and he is referred to as legitimate peripheral participant, which provides observation with the status of a learning activity (Dennen & Burner, 2007). This peripheral observation provides an initial level of experience (Dennen & Burner,

2008). Afterwards, when an understanding of the essence of a task is understood, peripheral participation transforms into active participation and the student completes small tasks that are part of a larger task (Lyons et al., 2016). This marks his shift from legitimate peripheral participant to becoming an inbound insider of the learning community (Matsuo & Tsukube, 2020).

Cognitive apprenticeship theory is characterized by several strategies for instruction. In this process, the task of teaching is centered around making implicit processes of learning explicit to the students to enable them to both observe and implement these processes (Dennen & Burner, 2007). The strategies are actions undertaken by teachers to engage students' cognitive processes in reflection, practice, and observation (Dennen & Burner, 2008). Primary strategies for instruction that are part of the cognitive apprenticeship theory include modeling, which involves the demonstration of the process of thinking; coaching, which involves provision of support and help to the cognitive activities of the students; reflection or scaffolding, which involves self-analysis and evaluation; articulation, which involves articulating the outcomes of reflection; and exploration, which involves the development and testing of hypotheses (Lyons et al., 2016; Matsuo & Tsukube, 2020).

Other strategies that have been reported include explanation, scaffolding, questioning, providing feedback, cognitive structuring, generalizing, self-directed learning, and approximating (Matsuo & Tsukube, 2020). Instruction in cognitive apprenticeship can also be viewed in phases, such as modeling phase, followed by scaffolding phase, followed by generalizing phase (Matsuo & Tsukube, 2020). While different researchers may have focused on instruction strategies within the context of cognitive apprenticeship theory, they are united on the instructional strategies and the of providing mentoring to students and engaging them in various

kinds of practice until there is no need for guidance (Lyons et al., 2016). Since the focus on the proposed study is on apprenticeships in technical training, the cognitive apprenticeship theory provides an important framework from which to analyze and consider the process of apprenticeship.

Theory of Change. Theory of change (Anderson, 2005) refers to the outcome that results from several critical-thinking processes through which a comprehensive image is imagined and articulated within a community in order to shape long-term change (Anderson, 2005). Change in programming or institutional change as in this case by incorporating registered apprenticeship programs, involves evaluation of the assumptions regarding the process of changes in order to make program assessment effective (Jocson & Martínez, 2020). Through theory of change, stakeholders are able to evaluate what can be affected, what outcomes can be attained, and whether certain expectations regarding the final outcomes are realistic given available resources and time (Reinholz & Andrews, 2020).

The theory of change was originally developed in the United States, with the goal of systemic change related to evaluation which supports the planning, implementation and assessment of a particular project (Amundsen & D'Amico, 2019). At its foundation, it involves a cumulative and systematic study of associations between context, outcomes, and activities through which is obtained a wide-scale framework for refining, testing, and understanding the connections between a particular intervention and the expected outcome. Such a connection forms a particular theory of change (Amundsen & D'Amico, 2019; Jocson & Martínez, 2020).

After the initial task of identifying the end goal that a particular intervention is sought to help realize, the theory of change involves a process where mapping is carried from that outcome to the various tasks that are required to be fulfilled in order to achieve that outcome (Jocson &

Martínez, 2020). Through this process, indicators are recognized as part of the change and identified and the implicit and explicit theories held by stakeholders involved in the intervention are articulated (Reinholz & Andrews, 2020). Specific tasks that are designed could be long-term, medium-term, or short-term (Amundsen & D'Amico, 2019). As a whole, such tasks would help develop a path towards the attainment of the final outcome of the intervention (Anderson, 2005). Thus, theory of change can be thought of as both a product as well as a process, with the overall objective of helping ensure an intervention or a long-term goal attains success (Anderson, 2005).

In the context of this study, using the Theory of Change, the intervention, (1) referred to the community college being able to address and implement a different training model which would incorporate a partnership with industry and students training part-time off campus; (2), it incorporated a more inclusive training model that would be welcoming to all students, lower educational costs to students and introduce the *earn and learn model* which would increase student completion and higher placements; and (3), this training model would in the long term provide apprenticeship programs as a pathway to high wage high skills jobs for students, especially focusing on diverse groups such as women and racial minorities. Thus, the Theory of Change helped provide further context to this proposed study through an articulation of the process through which the desired outcome in apprenticeship programs can be attained. As a result, together with the cognitive apprenticeship theory, it was used to form the theoretical framework in the study.

Objective-Based Program Evaluation to Increase Diversity. By 2050 it is predicted that 49% of the U.S. population will be minorities. In most industry sectors minority representation has not kept pace with the increase of minority population (Brown et al., 2005). The U.S. Department of Labor (2020), views apprenticeships as a strategy to increase diversity

into the workforce. In 2016, the U.S. Department of Labor released regulations related to Equal Employment Opportunity (EEO) to increase the level of students of diversity in the workforce and to assist industry in reaching a larger more diverse pool of women, minorities and individuals with disabilities.

It is imperative that the theoretical framework of program evaluation (Spalding, 2014), be used to determine if intended results have been achieved, specifically as it relates to increase participation of diverse populations in registered apprenticeship occupations. According to Spalding (2014), utilizing formative data as a way to evaluate the program is essential to measure outcomes related directly to the program and its success (2014). This would include a continuous evaluation of data, stakeholder groups, and outcome measures. Through program evaluation the ability to have a clear vision of the program, its outcomes and purpose assist in the design, management and develop of the programs intended outcomes. Making sure there is clear alignment with the purpose of the program, which supports continued stakeholder involvement is important and most often makes the difference on the ability to sustain a new apprenticeship program.

This study used retrospective data associated to enrollment, gender, and occupation among other variables that provided an understanding regarding the trend in enrollment of diverse populations as well as the diversification of occupations. The ability to use these data during the program gives the evaluators tools to make changes for program improved purposes. Program evaluation will strengthen the value on modifying a program even if it changes the variables in order to deliver a meaningful and effective program (Spaulding, 2014).

Gaps in Research

Limitation. A number of limitations can be identified in the literature that provide rationale for conducting this study. While the research reviewed focused on apprenticeship programs, community colleges, and diversity, there was a limited attention directed towards the utilization of community colleges as sponsors in expanding registered apprenticeship programs particularly for making such programs accessible to diverse populations. Researchers have not focused specifically on measuring the impact of community colleges in terms of diversification and expansion of registered apprenticeship occupations. Additionally, the question of whether such diversification could enhance the number of apprentices from underrepresented groups, such as women and racial minorities, in registered apprenticeship programs remains unaddressed.

Contribution. The identified gap was addressed through the study, in which the purpose was to determine the effect community colleges who are eligible to become sponsors have on the growth and expansion of registered apprenticeship occupations and the people who become apprentices. By assessing the data between individual community colleges that sponsor apprenticeship programs and comparing them with those who do not, with particular focus on new registered apprenticeship occupations, the characteristics of the apprentices, and inclusion of diverse populations, the findings of the study were demonstrated on the value that community colleges bring as registered apprenticeship sponsors who can influence the expansion of registered apprenticeship occupations and assist in diversifying the workforce.

Hypotheses

$H0_1$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H1_1$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H0_2$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

$H1_2$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

Research Questions:

1. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?
2. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?

Conclusion

The present chapter consisted of a review of literature concerning the research problem, organized by the research variables. In the first section, context regarding the research problem was provided. It was noted that historically, apprenticeship programs were viewed until the latter

half of the twentieth century with low regard in part because of the bias that apprenticeship programs were meant for high school students who were not considered fit for college (Fuller & Sigelman, 2017) and were strongly tied to union occupations. While there has been an increase in apprenticeship programs and apprentices since 2014, apprentices make up less than 5 percent of the American workforce.

In the second section, a discussion concerning the topic of registered apprenticeship programs was provided. Students who are part of apprenticeship programs are provided a paid work-based learning opportunity, along with related instructional training (Kuehn, 2019). While traditionally, apprenticeship programs were provided in occupations such as welding, maintenance, building ships, carpentry, electrical, emerging industries have expanded the apprenticeship programs into such areas as technology, finance, and healthcare (Kuehn, 2019; Monthey, 2019). In the third section, literature concerning community colleges and apprenticeship programs was discussed. Several barriers to expansion were noted, including those related to credit, organization, and environment. In the fourth section, the topic of apprenticeship programs and diversity was discussed. It was noted that income and wealth gaps based on gender and race have resulted in some groups experiencing low-wages and other limitations in the workforce (Turner, 2018).

Based on the gaps identified in the literature, such as limited attention directed towards the utilization of community colleges as sponsors in expanding registered apprenticeship programs particularly for making such programs accessible to diverse populations, the rationale for conducting the study was provided. By assessing the data between individual colleges that sponsor apprenticeship programs and comparing them with those who do not, the findings of the study demonstrated the value that community colleges bring as registered apprenticeship

sponsors who can influence the expansion of registered apprenticeship occupations and assist in diversifying the workforce. In the next chapter, the methodological details for conducting the study will be discussed.

CHAPTER THREE
METHODS

Registered Apprenticeship Programs have been around for centuries, and they have proven their benefit not only to employers who retain these employees at a 94% rate after completion, but for students themselves who often graduated debt free and have an average starting wage of not less than $70,000 (Reed et al., 2012).

Community colleges have been involved in work-based strategies since their inception, and since 2014 many colleges across the country have increased their involvement in registered apprenticeship programs, not just as related instruction providers, but where allow, as sponsors of such programs. Based on their location in both rural and urban communities, their relationship with industry, and being premier workforce training partners, community colleges are well established in being key partners to the expansion of registered apprenticeship occupations. With the expansion of occupations outside of the traditional registered apprenticeship programs, such as in healthcare, cybersecurity and culinary, this expansion will grant opportunity for an increase in women and diverse populations along with meeting the workforce skills-gap of today (Klor de Alva & Schneider, 2018).

The purpose of this study was to identify that there is an association between the increase in diversity and women in apprenticeship programs when community colleges can be sponsors of registered apprenticeship programs. This was a quantitative positivist causal-comparative study using existing data that has been collected through an initiative by the American Association of Community Colleges (AACC), called the Expanding Community College Apprenticeships

(ECCA) Initiative. This study was a longitudinal study using aggregate data gathered over a three-year period specific to the ECCA initiative managed by (AACC).

Primary Research Questions

This study's research questions are as follows:

1. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?

2. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?

Hypotheses

$H0_1$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H1_1$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H0_2$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

$H1_2$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

Research Design

Using a positivist research paradigm, this study utilized a causal-comparative research design. Causal-comparative research is a form of associative research used to determine differences between already existing groups (Fraenkel et al., 2019). For the researcher, information about reality is derived from experience and is interpreted through reason and logic which in turn produces knowledge about the reality being studied (Kivunja & Kuyini, 2017). The notion that if a given reality exists, it can be verified and is authentic (Kivunja & Kuyini, 2017). This study compared existing data on the number of apprenticeship programs and diversity of students (i.e., race, gender) on colleges that are sponsors of apprenticeship programs versus those that are not. Under the ECCA initiative there was growth of non-traditional occupations and an increase of women and diverse populations. The researcher speculated that this growth and expansion was due to the recent ability of community colleges to become sponsors of programs. The data used in this study are existing data, so the groups only differ based on one criterion or characteristic, which is the predictor variable of sponsorship of apprenticeship programs (Fraenkel et al., 2019). The outcome variables included expansion of occupations, gender and diversity.

As stated by Fraenkel (2019), there are threats to the internal validity of causal-comparative studies. Below is the list of these threats with possible methodological strategies aimed at reducing their impact.

1. Lack of randomization: The researcher used the entire population collected through the colleges involved in the ECCA initiative that were submitted through the Appian database. Hence, no *sampling* of colleges took place in this study.

2. Subject Characteristics: The researcher had no selection on the two comparison groups which consisted of colleges that are sponsors versus those that are not. There was a possibility of colleges not being equivalent on a number of variables (e.g., having more experience than other colleges in the realm of apprenticeship programing, industry involvement and interest, student population) (Fraenkel et al., 2019). This study matched on student demographics to include gender and race and broke down into location. Detailed description of the demographics on each group were provided to determine the degree of similarities existing across both.
3. Attrition: Participant colleges have signed an agreement with AACC to commit to participate in the ECCA initiative with the understanding that they would enroll the registered apprentices they serve (and their data) into the Appian database.
4. Location: Rural versus urban participant colleges may differ in their ability to work with a larger and more diverse number of industry partners and students. Since industry partners must be involved in the expansion of any registered apprenticeship programs, access to industry and the variation of industry would have a strong impact on colleges located in different regions. Location could also influence the number of students attending college as well as the diversity of said students. The process of data analysis controlled for location and determine the degree that this threat may impact the overall outcome of the study.

Setting

Data used for this study was collected from fifty-eight (58) individual colleges and eight (8) consortia colleges for a total of 106 colleges, all of which participated in the AACC - ECCA Initiative. Data from the 106 colleges included information on the registered apprentices they served during the period of performance of the ECCA initiative. AACC was responsible to work

with each of the college partners involved in the ECCA initiative to assist them and oversee their uploading of the data elements into the web-based Appian system. AACC also oversaw the validation of the data being uploaded, meaning they gathered information to verify that at the time of the initiative the student being served was a DOL registered apprentice. This was done through the attestation of DOL paperwork required for apprenticeship registration called a 671 document. A guidebook was provided along with webinars to assist colleges on how to use the Appian system to upload their data along with one-to-one technical assistance provided by AACC.

Participants

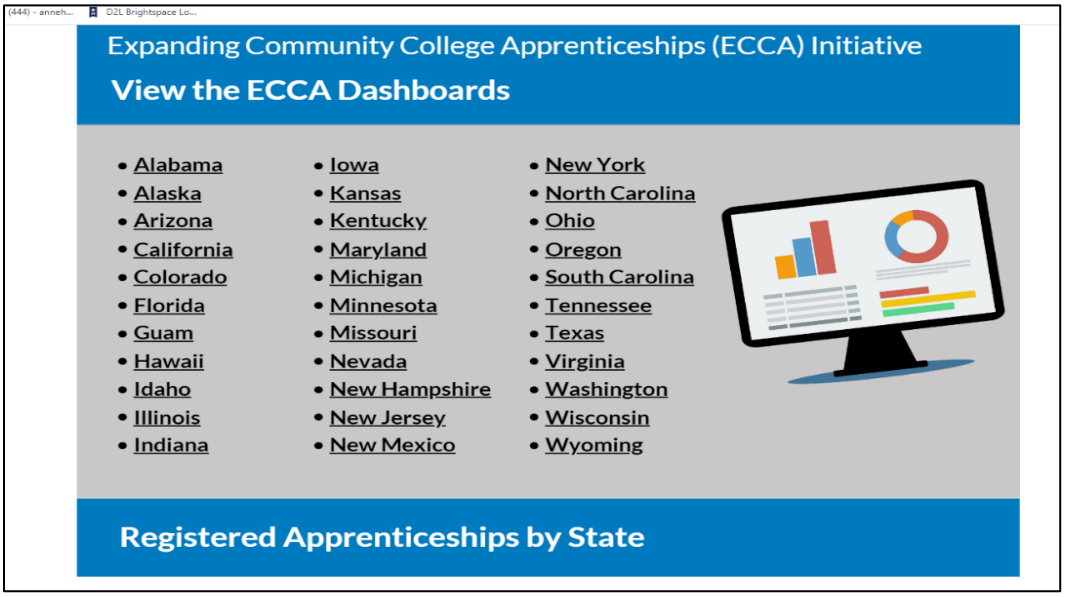
The colleges involved in this study are members of AACC and were self-selected to be part of the Expanding Community College Apprenticeship (ECCA) Initiative by applying through a Request for Proposal (RFP) process. The colleges were awarded through a committee selection administered through the American Association for Community College (AACC). The overall goal of the ECCA initiative is to serve at a minimum 16,000 registered apprentices over a three-year timeline. While there were other participants in the ECCA initiative to help meet this goal, the role of the (58) individual colleges and eight (8) consortia colleges have the overall goal of serving 12,000 apprentices. Each individual college is required to serve 150 apprentices and consortiums will serve each 450 apprentices. As colleges serve apprentices, they registered each apprentice by entering at a minimum the nine elements into the web-based data base Appian which is accessible to each ECCA partner.

Participant colleges are located throughout the United States in 31 states and territories and range from a whole state system of 16 colleges such as the Kentucky Community Technical College System that serve over a hundred thousand students, to rural colleges like San Juan

College in New Mexico serving less than 5,000 students. Some colleges are located in very rural areas such as Alaska and Washington, whereas others are located in metropolitan areas such as New York City, Chicago, and Los Angeles.

Table 3.1.

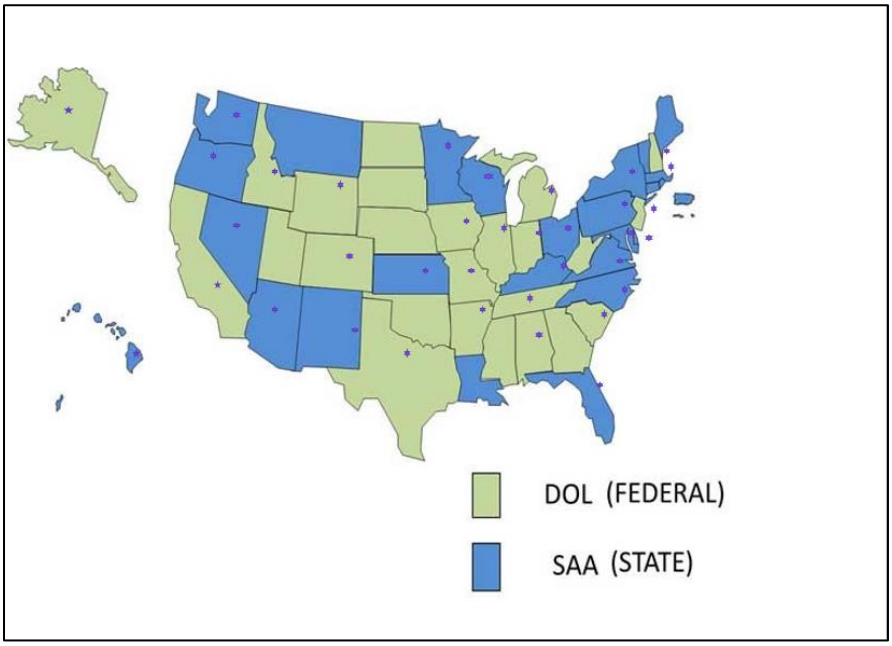
List of States who participated in ECCA initiative



Source: American Association of Community Colleges, 2020

Figure: 3.1.

Overlay of ECCA colleges in comparison to SAA vs. OA States



Source: American Association of Community Colleges, 2020 & US DOL, 2020

About half of the colleges are also Minority Serving Institutions (MSI), which means the college enrolls a significant percent of students from a minority group (another variable to control for when conducting data analysis). All participant community colleges are public institutions receiving tuition, which varies across states, and all offer some type of financial aid and assistance to their students. All the colleges enrolled in the ECCA initiative have career and technical education (CTE) programs which are focused on specific careers or career paths or what many term *trades*. These programs are designed by the colleges to meet industry needs within the area they serve. Today, that industry might include manufacturing, business and finance, healthcare and IT. The CTE programs remain under academic leadership and the college programs are managed by a dean. Faculty are qualified through education and work-based experience that aligns with the career they are teaching.

A snapshot of the students who attend the 1000 + public community colleges across the nation include: 57% women, 65% part-time students, 56% with diverse backgrounds, and the average age is 28 (AACC, 2021). Apprenticeship participants under this study are identified as individuals/students who were a current registered apprentice during their time when they attended a community college which was part of the ECCA initiative. The participants had to also be officially registered as an apprentice through either a State Apprenticeship Agency (SAA) or a Federal Office of Apprentice (OA) program.

Sampling

The population was based on the number of colleges that are part of the ECCA imitative and the number of registered apprentices they served during the study. The population were comprised of all 58 individual and 8 consortia colleges involved in the AACC ECCA initiative which would amount to a total of 106 community colleges. The ECCA colleges are located throughout the United States, in 31 states and territories. Each of the individual colleges under their agreement with AACC are required to serve from 75 to 150 apprentices and the consortia colleges that may be comprised from three to sixteen colleges are required to serve 450 apprentices for a total of 12,000 registered apprentices. This study included the accessible total population which all share one characteristic (Fraenkel et al., 2019) of being a registered apprentice in the Appian database.

Instrumentation

The platform used by AACC to collect the data elements is called Appian and it is one of the databased designed and used by the U.S. Department of Labor to collect information on several of their projects. Colleges select one person who will be charged with uploading the

information on the apprentices that are enrolled in their programs. The Appian platform utilizes a web-based platform which makes it accessible to individuals and programs under contract with the U.S. Department of Labor throughout the country to upload and track required data. The Appian platform is connected to the DOL RAPIDS platform which allows those participating colleges whose states use the Registered Apprenticeship Partners Information Database System (RAPIDS) to download the data directly into the Appian system. All other participating colleges that do not use the RAPIDS system will gain permission and access from AACC to manually upload their apprenticeship data into the Appian system. Data elements collected by each college on each participant included: (1) college name, (2) sponsorship of Registered Apprenticeship Program, (3) registered apprenticeship occupation, (4) Occupational Information Network (O*NET) Code, (5) gender, (6) ethnicity, (7) race, (8) veteran status, and (9) disability.

Data Collection

Data include the following: 1) Predictor Variable: Colleges (i.e., college is or is not a registered apprenticeship sponsor), 2) Outcome variable: registered apprenticeship occupations, and 3) Outcome variable: apprentices' demographic information (e.g., race, gender). The data were compared across the predictor variable, that is, colleges who are sponsors versus those that are not. The collection of these data for this study was made available through a cooperative agreement between the U.S. Department of Labor and the American Association of Community Colleges, with the overall goal of the partnership to expand registered apprenticeships utilizing involvement from community colleges. Through the involvement of 58 individual colleges and 8 consortia colleges, the overall outcome number was to serve 12,000 registered apprentices within a three-year timeline. The data collected are captured through an online web-based databased

called Appian, the system that has been collecting the data on the ECCA initiative since October of 2019.

Data were entered into the Appian system by one identified person at each of the college campuses. Those individuals are given permission by AACC to enter data into Appian through a registration process. A guidebook, along with webinars and one to one technical assistance, is provide by AACC to assist colleges on how to use the Appian system. A college that is a sponsor, may also register their apprentice participants through the Federal Employment and Training RAPIDS database. All the Federal OA states and some of the SAA use this tracking tool. Those SAA states that do not use this tracking tool are required to submit their data quarterly to the federal OA office. The Appian database is aligned to the RAPIDS system so those colleges who are sponsors in an OA state can download information on the apprentices they are serving under ECCA right into the Appian database.

Each quarter within the three-year period AACC pulls the data from Appian on the numbers served through ECCA and submits this information through a quarterly report to the U.S. Department of Labor. AACC also shares other elements of the data collected with the members of the ECCA initiative including each college participant. The data are also shared with the AACC overall membership including the AACC Board of Directors and the ECCA Advisory Board. In sharing these data, the names of individual apprentices were never used, released or shared, only aggregate data was pulled and shared with all the parties listed above.

Data Analysis

Because of the different types of variables in this study, several types of analysis were completed. Descriptive statistics (i.e., measures of central tendency, measures of dispersion)

were used to provide detailed description of participant colleges on all available student demographic information as well as college-related data (e.g., location). Independent samples t-Tests were utilized to test the study's hypotheses. The statistical assumptions required when utilizing independent samples t-tests were explored upon gaining access of the data. The author can confirm that the first three assumptions (i.e., outcome variable is measured on a continuous scale, the predictor variable generates two categorical independent groups, there are independent observations) have been met. The remaining 3 assumptions (i.e., absence of significant outliers, normal distribution of outcome variable on each group, homogeneity of variances) were determined once the data are made accessible to the author. The Statistical Packet for the Social Sciences (SPSS) was used for that purpose. If one of the remaining statistical assumptions to test the study's hypotheses with a t-Tests was violated, the author was prepared to use the Mann-Whitney U non-parametric data analysis route.

Table 3.3 provides the description of the alignment between the research questions that guided this study and the methods used in this study to ensure all variables have been accounted for.

Table 3.2.

Research Question(s) and Table of Alignment

Research Question	Research Design	Variables	Instrument	Sources and Expected Sample Size	Technique	Validity and Reliability
PRQ1 What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?	Causal-Comparative	Community Colleges Diversification of Occupations Expansion of Occupations	Appian Database	Entire Population	Secondary Data Analysis -Descriptive Statistics (i.e., measures of central tendency, measures of dispersion)	N/A
PRQ2 What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?	Causal-Comparative	Community Colleges Demographic diversification	Appian Database	Entire Population	Secondary Data Analysis -Descriptive Statistics (i.e., measures of central tendency, measures of dispersion)	N/A

H01 There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.	Causal-Comparative	Community Colleges Occupation Expansion and Diversification	Appian Database	Entire Population	Secondary Data Analysis -Inferential Statistic: t-Test	N/A
H02: Diversification does not increase the number of women and diverse populations in register apprenticeship programs	Casual-Comparative	Community Colleges Demographic Diversification	Appian Database	Entire Population	Secondary Data Analysis -Inferential Statistic: t-Test	N/A

Procedures

Data for this study are uploaded by the individual colleges involved in the ECCA initiative into the Appian database, which is an online web-based platform and managed by AACC. The ECCA initiative period of performance started in March of 2019, but data did not start being collected until October of 2019 due to the building of the data-base, aligning the database to the Federal RAPID system, and the training with all the colleges involved in the ECCA initiative.

Data from October of 2019 through the end of September of 2021 were retrieved for this study. The researcher gained access to the data from the Associate Vice President of Research at AACC. This process was achieved through an email sent directly to the Associate Vice President listing the data to be pulled. Once sent, the time to receive the data is less than a day. The data were populated into an Excel spreadsheet containing the colleges' information (e.g., sponsorships status, occupations, gender, race, veteran status and disabilities), which then was used to populate the SPSS database in which the data analyses was conducted.

Ethical Considerations

The potential risk to colleges is very low as these data were collected retrospectively. The data used in the study were aggregated, hence, no specific identifiers are available. This study was approved through the Institutional Review Board (IRB) of Minnesota State University Moorhead (MSUM). See Appendix A for the MSUM IRB approval form.

Conclusion

This study was designed as a quantitative Causal- Comparative design to analyze apprenticeship occupational expansion during the timeline of the Expanding Community College Apprenticeship (ECCA) initiative. The overall goal of ECCA initiative through the 106 community colleges was the expansion of 12,000 registered apprenticeships within a three-year time span. The researcher utilized existing data from the quarter starting in October 2019 through the quarter ending September 2021. The data used were existing data pulled in an aggregate format, so no individual participant information was shared throughout the study. The next chapter will include the results, the discussion based on the results and the conclusion and recommendations from the findings.

CHAPTER FOUR
RESEARCH RESULTS

Two-year higher education institutions are relatively new to the registered apprenticeship world. Increased levels of community college involvement with apprenticeship programs began with the investment by the U.S. Departments of Labor and Education through the Registered Apprenticeship Community Colleges initiative in 2015. Registered apprenticeships remain a key workforce strategy as an affordable pathway to secure high paying jobs and meet the changing labor market in high-skill, high-demand jobs. Colleges are well versed in career pathways and career and technical education (CTE) training programs, which are developed to meet the workforce demand. Through these existing programs, colleges are well established to sponsor registered apprenticeship programs. Many of the apprenticeship programs that colleges are expanding into are well beyond the traditional apprentice occupations of construction and advanced manufacturing programs, and include occupations such as medical assistant, hospitality, and cybersecurity. The mission of most community colleges is to design work-based training programs to meet industry expanding occupational workforce needs. Registered apprenticeship programs aligned with CTE programs and offer a *earn and learn* career pathway for students. Colleges build the necessary relationships with industry which help create career pathways by community colleges to meet the workforce "skills-gap" (Browning & Nickoli, 2017).

The national average diverse student population at a community college is over 56% and today women account for more than half of the student body (AACC, 2020). Community colleges are well versed in supporting and providing greater opportunities to people who are underrepresented. This has been achieved by designing learning opportunities that meet the

needs of all students such as competency-based curricula and applied learning opportunities. Colleges provide a variety of occupational opportunities to choose from, including pathways in healthcare, IT, culinary and others, which attract a more diverse student population. Colleges also offer wrap-around services to help retain and support first-generation, adult learners, veterans, and individuals with disabilities. Students who have gone through a registered apprenticeship program have higher completion rates, graduate debt free, and most have a job upon completion (Reed et al., 2012). They also receive a nationally recognized credential, along with an academic credential, which combined, provide a career pathway to higher levels of education. According to the U.S. Department of Labor (2021), completion rates of students who enroll and complete an apprenticeship program is 97%, which is higher than the overall retention rate of 59% at community colleges.

According to Klor de Alva and Schneider (2018) and the U.S. Department of Labor (2020), registered apprenticeships benefit employers through lower employee turnover, higher employment retention (94%), and a reduction in recruiting cost (Reed et al., 2012). Industry benefits when colleges are sponsors, because their relationship with educational institutions secure the provision of best practices training to meet the existing “skills gap” and future workforce demands (Spiker, 2019). Colleges as sponsors can play the administrative role in registered apprenticeship programs, which can be overwhelming for businesses. Additionally, sponsor community colleges can serve several industry partners at a given time. This benefits those small and medium size companies that would not otherwise be able to support registered apprenticeship programs on their own. Sponsorship involves working directly with industries to design workforce programs that keep them competitive and in the market. Because community colleges are established in their communities, they already have these existing relationships and

are poised to be leaders in the expansion of new occupations that meet the registered apprenticeship program model.

While there are a number of benefits to colleges being sponsors, there exist some obstacles. In the USA, about half of the states' apprenticeship programs are directed under State Apprenticeship Agencies (SAA). In those states, the SAAs determine their own apprentice policies and procedures (U.S. Department of Labor, 2020). Many of these SAA states have not fully recognized higher education institutions as being sponsors and many community colleges have not explored the possibility of implementing this workforce strategy into their offerings.

Yet, there are proven benefits for community colleges to be become sponsors for registered apprentices, such as, designing alongside industry new training programs which meet workforce demand, offering career pathways for students while students are being paid, and recruiting and retaining non-traditional students into these markets.

Purpose of Study

The purpose of this study was twofold, first to investigate whether community colleges that were sponsors had an impact on the diversification growth and expansion of registered apprenticeship occupations. Second, to investigate whether, due to occupation expansion, community colleges that were sponsors had an impact on the diversification of apprentices. Specifically, women and ethnically diverse students. This causal-comparative quantitative study was formulated to analyze secondary existing data collected by the American Association for Community Colleges.

Research Questions

1. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?

2. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?

Hypotheses

$H0_1$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H1_1$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

$H0_2$ Null: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

$H1_2$: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

Results

The researcher used data that were collected through the American Association for Community Colleges (AACC), Expanding Community College Apprenticeships (ECCA)

initiative. Data for the study were collected from 58 individual colleges and 8 consortia colleges between October 2019 and at the end of September 2021. The researcher gained access to the data from the Associate Vice President of Research at AACC, who submitted an Excel spreadsheet containing college and student information (e.g., sponsorships status, occupations, gender, race). A data dictionary was included with the raw data to assist in identifying all the data fields, this dictionary was used to determine if any of the 58 different data fields included in the database were relevant to the study. Also, the dictionary was utilized to clarify the nature of the data contained in some of the data fields (e.g., apprentices home state, 12 career areas as identified by the Department of Labor (DOL), regions as identified by DOL). Of the 58 data fields contained in the original database, a total of 13 were identified as relevant for this study. A new database was saved and containing exclusively these 13 variables which were then uploaded into SPSS. The data were taken from 94 community colleges across the USA, representing 31 states and territories with a total of 8,923 students.

Participants

This research was informed by data gathered from 94 participating community colleges in the Expanding Community College Apprenticeships (ECCA) initiative. Of the 94 participating community colleges, 49 were non-sponsors, 37 were sponsors, and 31 had a combined status. The combined status sponsor colleges were colleges that had sponsorship ability but were not a sponsor for an occupation identified in the study. In this study they are identified as “sponsor (not applied)” colleges. Combined, these colleges had 8,923 students. See Table 4.1 for demographic information by sponsorship status.

Table 4.1.

Sponsorship Status College Numbers

Sponsorship Status	Number of Students	Number of Colleges
Sponsor	1,591	37
Non-Sponsor	5,472	49
Sponsor (Not Applied)	1,860	31

The colleges were located throughout the United States and represent 31 states and territories. The community college locations vary with a number in rural states (e.g., Alaska, New Hampshire and Washington), and many in metropolitan areas (e.g., New York City, Chicago and Los Angeles). All were public two-year institutions and varied in the number of students enrolled from 5,000 to 12,000 students.

Students enrolled in sponsor colleges had the highest (34.6%) postsecondary level of education (measured at the start of apprenticeship), compared to non-sponsor (17%), and sponsor (not applied) (8.7%) community colleges. Sponsor (not applied) colleges had the highest level of high school graduates (57.1%), compared to sponsor (40%) and non-sponsor (40%). Among all colleges, non-sponsor college students had the highest ($94,993) wage earnings compared to sponsor ($87,360) and sponsor (not applied) ($86,736). However, non-sponsor colleges also had the students with the lowest wage earnings ($14,560) compared to sponsors ($15,080) and sponsors (not applied) ($15,081) demonstrating closer wage earnings. These data provide a clear indication that across groups, the range of wage earnings do not differ significantly

When broken into six regions (i.e., Northeast, East, Southeast, Midwest, Northcentral/South, and the West), the highest number of colleges was in the Midwest region

(31%), 23% were located in the Southeast, West Coast (16%) including Hawaii, Alaska and Guam, (10%) Northeast, (9%) Northcentral/South, and the lowest percentage (5%) in the East. Northeast colleges had the highest percent of women (25.8%) and the Southeast had the lowest percent of women (8%). White men were the highest population across every region, Asians were the least represented. When analyzed by regions, Northcentral/South (32.7%) and the West (30.8%) had the highest Hispanic representation, and the Midwest had the lowest (6.2%) Hispanic representation.

Research Question 1. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?

In order to secure equal college representation from each one of the three groups, the researcher decided to select 30 colleges from each group. These community colleges were selected using a Table of Random Numbers (appendix 3). The 90 colleges selected were coded as sponsor (i.e., 1), non-sponsor (i.e., 0), and sponsor (not applied) (i.e.,10).

To investigate the relationship between sponsorship status and the diversification of registered apprenticeship occupations, the researcher compared each group and the respective number of apprenticeship programs offered. It is important to mention that the number of apprenticeship programs listed in the database obtained for this study was determined by the condition of students enrolled in the program. What this means is that while some community colleges may have offered more apprenticeship programs, if these did not have any students enrolled, then the programs would not have been added to the database. Table 4.2 shows the total occupations offered by each group of colleges. Colleges with non-sponsor status offer a larger

diversification of occupations, followed by sponsor community colleges and sponsors (not applied).

Table 4.2.

Occupations and Sponsorship Status

Sponsorship Status	Number of Occupations
Sponsor	55
Non-Sponsor	99
Sponsor (Not Applied)	44

Table 4.3 shows the colleges broken down by sponsorship status and the number of students and % of students represented in each of the career sectors.

Table 4.3.

Career Sectors, Community College Sponsorship Status, and Number of Students Enrolled

Career Sector	Sponsor	%	Non-Sponsor	%	Sponsor (Not Applied)	%
Advanced Manufacturing	526	33.1%	1159	21.2%	443	23.8%
Agriculture	67	4.2%	0	0	9	0.5%
Construction	454	28.5%	3335	60.9%	1220	65.6%
Energy	2	0.1%	28	0.5%	29	1.6%
Finance and Business	7	0.4%	107	2.0%	1	0.1%
Healthcare	177	11.1%	295	5.4%	49	2.6%
Hospitality	76	4.8%	6	0.1%	0	0

Information Technology	66	4.1%	49	0.9%	0	0
Miscellaneous	148	9.3%	93	1.7%	106	5.7%
Telecommunication	0	0	43	0.8%	0	0
Transportation	68	4.3%	357	6.5%	3	0.2%
Total	1,591	100%	5,472	100%	1,860	100%

Among sponsor colleges, the most popular career sectors were advanced manufacturing (33.1%), construction (28.5%), and healthcare (11.1%). The least popular career sector with the same group was telecommunications (0%), energy (0.1%), and finance and business (0.4%). Among non-sponsor colleges, construction (60.9%) was the most popular occupation, with advanced manufacturing (21.2%), and transportation (6.5%), being the next highest occupations. Hospitality (.1%), and telecommunications (.08%) were the least popular. Sponsor colleges (not applied) show construction as the preferred (65.6%) occupation, with advanced manufacturing (23.8%) second, and the least popular being finance and business (.1%). The occupations of healthcare (11.1%), hospitality (4.8%), and information technology (4.1%), showed a substantially higher number in sponsor groups than non-sponsor colleges.

Table 4.4 shows a number of occupations and the percent of students enrolled into these registered apprenticeship programs. The occupations are divided into categories designed by the Bureau of Labor as Standard Occupation Classification (SOC) code system. This system is used by federal agencies to classify workers into occupational categories for the purpose of collecting, calculating, and disseminating data. All workers are classified into one of 867 detailed occupations where skills, similar job duties, and sometime training are grouped together.

Among sponsor colleges the highest occupations include electricians (15.3%), industrial machinery mechanics (10.2%), and heating and air conditioning (5.8%). Lowest occupations include construction, compliance officers, and bartenders. Among non-sponsor colleges the highest percentages were in the occupations of electrician (18.8%), plumber and pipefitters (8.5%), and heavy trailer truck drivers (6.1%). The lowest were in computer networking, architectural, and paramedics. For Sponsor (not applied) highest occupations include electricians (30.5%), plumber and pipefitters (11.8%) brick masons (8.2%), and the lowest include health technologists, appliance repairs, and mold makers.

Table 4.4.

Occupations Identified by Standard Occupation Classification (SOC) Titles

Sponsor	%	Non-Sponsor	%	Sponsor (Not Applied)	%
Electrician	15.3	Electrician	18.8	Electrician	30.5
Industrial Mechanics	10.2	Plumber and Pipefitters	8.5	Plumber and Pipefitters	11.8
Heating and Air Conditioning Technician	5.8	Heavy Trailer Truck Driver	6.1	Brick Masson	8.2
Construction	3	Computer Networking	4	Health Technologist	1
Compliance Officer	1	Architecture	0	Appliance Repairs	1
Bartender	1	Paramedics	0	Mold Makers	1

In chapter 3, the researcher identified the t-Test would be utilized to analyze the data which is used to compare the scores of two different groups. The data show that there were three groups, the research could no longer use the t-Test to compare sponsor to non-sponsor. The researcher switched to the one-way ANOVA, which would compare the three college groups (i.e., sponsor, non-sponsor, and sponsor (not applied)).

Hypothesis 1

Null Hypothesis: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations.

Alternative Hypothesis: There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations

In order to test the null hypotheses 1, the statistical assumptions were checked to run a one-way ANOVA. The predictor variable was “sponsorship status” and the outcome variable were “number of occupations offered.” The data showed that there was a statistically significant difference for occupations at the $p < .05$ level between the three groups [$F(2, 5.94, p = .004]$.

Table 4.5.

Bonferroni Post-Hoc Comparison Expansion of Occupations

Sponsor Status	Sponsor Status Comparison	Mean Difference	Significant Difference
0	1	2.633	.006*

	10	2.300	.021*
1	0	-2.633	.006*
	10	-.333	1.000
10	0	-2.300	.021*
	1	.333	1.000

*P<.05

Table 4.5 shows the Bonferroni post-hoc test indicating that there was a statistically significant difference between non-sponsor and sponsor, and non-sponsor and sponsor (not applied) in the number of occupations. The mean number of occupations in non-sponsor community colleges (M = 6.13, SD = 3.84), was significantly higher than the number of occupations in sponsor community colleges (M = 3.50, SD = 2.76), also higher than sponsor (not applied) colleges (M = 3.83, SD = 2.96). There was no significant difference between the sponsor and sponsor (not applied) groups. Therefore, the alternative hypothesis is accepted, and the null hypothesis is rejected.

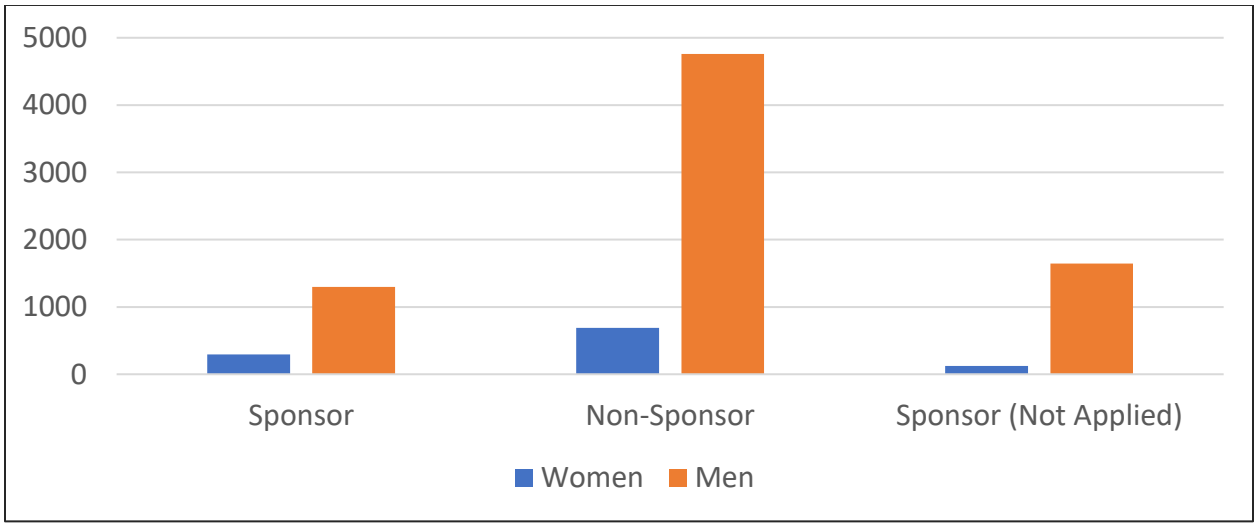
Research Question 2. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?

To investigate the relationship between sponsorship status and the diversification of students by gender and race, the researcher compared each group across these two variables. It is important to clarify that gender was defined by AACC using the Integrated Postsecondary Education Data System (IPEDS), which is the system used to track data by the National Center for Education Statistics (NCES) for all postsecondary institutions that receive federal student financial aid. Figure 4.1 demonstrates that men made up a significant percentage in the overall

total student population (86.3%) and a significant percent in all three college groups. Women only made up 12.3% of the total student population with the highest percentage in the non-sponsored group.

Figure 4.1.

Gender Differences by Sponsorship Status



Race was tracked based on seven different categories as determined by IPEDS which is the system used by AACC. Table 4.5 shows Whites were the largest racial group in the sample of students (54%), followed by Hispanics of any race (19%), Blacks (8%), Asians (.01%), Native Americans (.01%), and the smallest group was that of Native Hawaiian/Pacific Islander (.009%). There were also the categories of more than one race (.007%) and that of students who did not self-identify, which accounted for 13% of the total student population. White men were the largest population among all races (89.9%). Among women, Asian (25.6%), Native American (24.8%), and Native Hawaiian/Pacific Islander (25.8%) were the largest groups.

Table 4.6 showed the designated categories of races in comparison to all three groups of colleges. Whites are significantly higher than any other race in all three groups (54%) with the Hispanics being the second highest in non-sponsor colleges (14%), and race not identified as the third highest (8%) in the non-sponsored colleges. Native Hawaiian/Pacific Islander race was not represented in the community college sponsor group and had low representation (lower than 1%) in the college sponsor (not applied) group. Many of the race categories were lower than 1%.

Table 4.6.

Student Race and Community College Sponsorship Status

Race	Sponsor	Non-Sponsor	Sponsor (Not Applied)
Black	130	492	103
	(1%)	(6%)	(1%)
Asian	26	88	11
	(0%)	(1%)	(0%)
Hispanic of any race	272	1226	281
	(3%)	(14%)	(3%)
More than one race	20	39	12
	(0%)	(0%)	(0%)
Native American	9	86	26
	(0%)	(1%)	(0%)
Native Hawaiian/Pacific Island	0 (0%)	75 (1%)	6 (0%)
Race Unidentified	133	699	329
	(1%)	(8%)	(4%)
White	1001	2767	1092
	(63%)	(51%)	(59%)

Figure 4.2.

Student Race and Community College Sponsorship Status

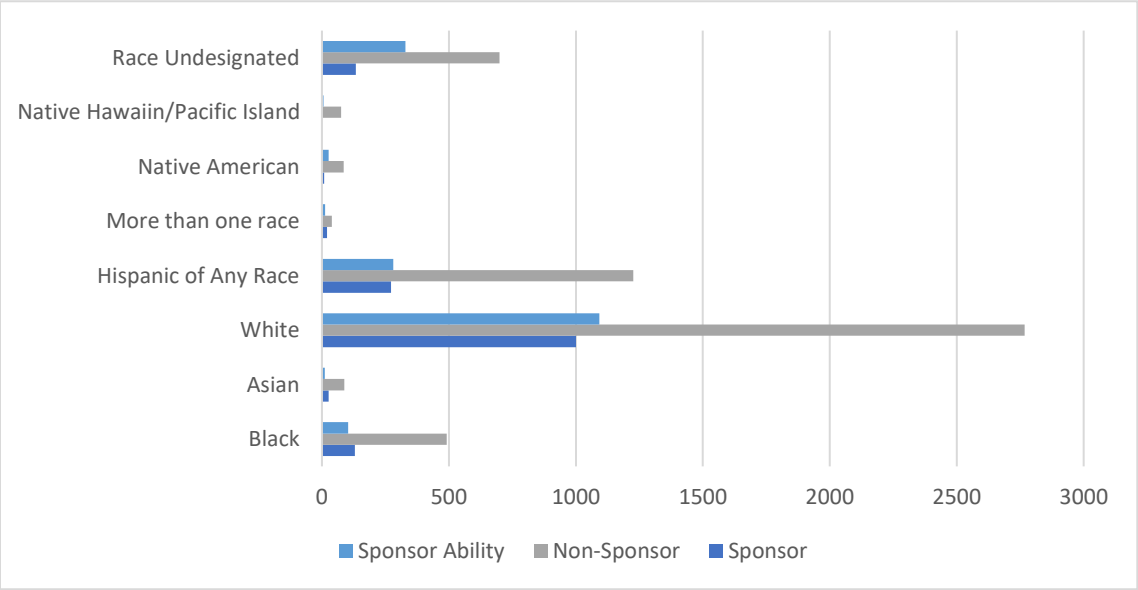


Table 4.7 shows the gender and race of students by career sectors. For men, the highest populated career sectors were agriculture (98.7%), construction (96.1%), and telecommunications (93%). Women had higher populations in the career sectors over males in finance and business (69.6%), and healthcare (77.4%). Women and men were evenly split in hospitality (women 49.4%) (men 50.6%).

The table shows that not all races were represented under each category. Whites are represented in all ten sectors and had the highest participation in construction and advanced manufacturing. Whites are lowest in energy and telecommunication. Agriculture was a career sector only chosen by Blacks, Hispanics, and Whites. Business and finance had the highest representation by Whites and those who identified as “race unknown”. Healthcare had representation in all ten sectors with the highest representation from Whites and Hispanics and

lowest from Asian and Native Hawaiian/Pacific Islander. Transportation's highest representation was from Whites and Blacks.

Native American race was the least represented and were not enrolled in four of the ten sectors. The data show that the occupations of construction and agriculture in that order, were the highest populated for all represented races except for Native Hawaiian/Pacific Islander.

Table 4.7.

Career Sectors by Student's Race and Gender

Baseline Characteristics	N	%	Women	Men	No Self – Identity	Asian	Black	Hispanic More Than One Race	Native American	Native Hawaiian/ Pacific Islander	Race Unknown*	White
Advanced Manufacturing	2128	23.8	231	1883	14	29	83	380	17	11	318	1290
Agriculture	76	.9	1	75			5	24				47
Construction	5011	56.1	188	4817	6	40	381	1105	75	21	577	2812
Energy	59	.7	5	54			1	2	1	4	38	13
Finance & Business	115	1.3	80	33	2	2	14	21		9	34	35
Healthcare	521	5.8	403	118		28	64	107	19	2	64	237
Hospitality	83	.9	41	42		2	16	7			11	47
Information Technology	115	1.3	20	95		4	17	37		1	7	49
Miscellaneous	347	3.9	58	192	97	7	25	40	3	1	127	137
Telecommunications	43	.5	3	40		1			1	29	2	10
Transportation	428	4.8	71	357		12	120	56	5	3	47	184

*Reflects more than one race or race was not self-identified

Hypothesis 2

Null Hypothesis: There is no significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

Alternative Hypothesis**:** There is a significant statistical impact of community colleges becoming sponsors of registered apprenticeship programs on the increase of women and diverse populations.

The one-way ANOVA Table 4.8 determined that there was a statistically significant difference at the $p < .05$ level between the three groups related to the number of women [$F(2,87) = 3.5$, $p = .035$]. Non-sponsor community colleges had more women than sponsor (not applied) community colleges.

Table 4.8.

ANOVA Results Comparison Expansion of Women

	Sum of Squares	Degree of Freedom	Mean Square	Frequency	Significant Difference
Women	1329.156	2	664.578	3.480	.035*

*p<,05

Table 4.9 shows the Bonferroni post-hoc test, indicating that there was a significant difference between non-sponsor and sponsor (not applied) community colleges in the number of enrolled women (p<.030). The mean score for non-sponsor (M = 13.40, SD = 17.19) was significantly higher than the mean number of women in sponsor (not applied) (M = 4.0, SD = 7.93) community colleges. There was not a significant difference between sponsor and non-

sponsor community colleges and neither between sponsor and sponsor (not applied) community colleges.

Table 4.9.

Bonferroni Post Hoc Results Comparison Expansion of Women

Sponsor Status	Sponsor Status Comparison	Mean Difference	Significant Difference
0	1	4.267	.705
Non-Sponsor	10	9.400	.030*
1	0	-4.267	-12.98
Sponsor	10	5.133	-3.58
10	0	-9.400	.030*
Sponsor (not applied)	1	-5.133	.462

*$p<.05$.

Results showed that there was no statistically significant difference in the diversification of races among the three groups of community colleges.

Therefore, the alternative hypothesis is accepted for women and the null hypothesis is accepted for race.

Conclusion

Chapter four explained the data collection process, and the statistical results for the data analysis. The analysis conducted demonstrated that non-sponsor community colleges had a more diversified pool of occupations than both sponsors and sponsors (no applied). Likewise, there was a significant difference between non-sponsors and sponsors (not applied) in the expansion of

women, but not a significant difference between non-sponsors and sponsors, or sponsors and sponsors (not applied). There was no significant difference among diverse populations in all three groups. Chapter 5 will provide an interpretation of the findings along with the conclusions, implications, limitations, and recommendations for further research.

CHAPTER FIVE

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Chapter five will present a summary of the problem and the main result of the study based on the data presented in chapter four. Specific implications, conclusions and recommendations will be examined, and limitations and ideas for further research will be presented.

This study was designed to investigate whether sponsorship had an impact on the diversification growth and expansion of registered apprenticeship occupations as well as the diversification of apprentices enrolled, specifically women and racially diverse students. Participants included 94 community colleges that were all part of the American Association for Community Colleges (AACC), Expanding Community College Apprenticeship (ECCA) initiative.

The researcher organized this study based on the literature (Browning & Nickoli, 2017; Lerman, 2009) and on conversations with community college leaders on the effect they believed that community colleges becoming sponsors could have on the expansion of occupations beyond the traditional apprenticeship programs (e.g., carpentry, electrical, welding, machining). These leaders also believed new occupations would support the recruitment of new students into their colleges, and by being sponsors of apprenticeship programs they could build stronger relationships with industry to meet the “skills-gap” that existed (pre-pandemic). In fact, one of the colleges involved in the ECCA initiative found that the apprenticeship programs increased their student numbers, which lead to increased faculty loads and new teaching opportunities, which in turn increased revenue for the college (AACC, 2021). As the past director of the AACC

ECCA initiative, working with over 100 community colleges across the nation on apprenticeship expansion, the researcher experienced first-hand new occupational growth (i.e., medical assistant, landscaping, computer technology) being developed and implemented. The researcher aimed at determining the impact community colleges who are eligible to become sponsors have on the growth and expansion on registered apprentice occupations and the people who become an apprentice, specifically women and diverse populations.

Summary of the Study Methodology

This was a causal-comparative study, using secondary data that were collected by the AACC. Two research questions formulated were meant to explore the impact of community college sponsorship in expanded registered apprentice occupations and the diversification of women and race.

Research Questions

1. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?
2. What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?

Summary of the Findings

This section will address both research questions to provide an interpretation of the quantitative data shared in chapter four in association to the comparison of the predictor variable, sponsorship status**.** There were three identified groups in this study. Colleges that were sponsors

of apprenticeship programs (sponsors), colleges that were not sponsors of an apprenticeship program (non-sponsor), and the third group were colleges who had sponsorship status but were a non-sponsor for an occupation identified in the study. The latter group was identified as sponsor (not applied).

The results for the first research question demonstrated that there was a significant difference across groups in the diversification of occupations. Specifically, the results indicated that non-sponsor community colleges had higher number of occupations than sponsor and sponsor (not applied) community colleges. The second research question provided further information to explain the relationship between the expansion of occupations and the increase of women and racially diverse students in registered apprenticeship programs. The results indicated that sponsors and non-sponsor community colleges had larger numbers of women than sponsors (not applied). No differences were observed across colleges in the diversification of racially diverse students.

The following section will provide discussion as well as recommendations based on the findings and the literature for each of the study's research questions.

Research Question 1

> What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the diversification and expansion of registered apprenticeship occupations?

This quantitative study explored and compared the expansion of registered apprenticeship occupations at the level of community colleges as a venue to create not only an academic

pathway for students (Lerman, 2009), but also, as a venue to expand occupations in registered training programs, thus creating opportunities to increase women and diverse populations in these training programs (Dimeny et al., 2019).

Expanded Occupations

The results from this study showed that non-sponsor colleges were more diversified in the expansion of occupations than sponsors and sponsor (not applied). While this finding contradicts the literature, it demonstrates the value that non-sponsor colleges bring to the diversification of occupations and the value all community colleges as partners bring to registered apprenticeship programs. There could be several influences that supported the outcome based on the literature.

Non-sponsor colleges represented the largest number of students (61%), and the largest number of colleges (52%) in this study. Sponsorship within community colleges is still recently new. Colleges themselves did not play the role as a sponsor in registered apprenticeship programs until after 2008, when the Employment and Training Administration (ETA) revised and added flexibility allowing colleges to be sponsors and flexibility to expand into occupations beyond construction and manufacturing (U.S. Department of Labor, 2018). Before this, construction sites and trade unions according to the literature (Dimeny et al., 2019) were the main training sites for apprenticeship occupational training. A college's role in these partnerships was to act only as a non-sponsor providing the related instruction for the apprentice training.

Non-sponsor colleges in this study did not move beyond this role with industry, they continued to act as the partner providing related instruction. Because of those existing relationships and their ability to build new industry partners relationships, they were able to

serve a larger number of students and expand into new occupations (Garza Mitchell, 2017; Tesfai, 2019). Because of this, non-sponsors could have had more flexibility in working with industry in developing curriculum, contributing to the expanded occupations, while meeting industry needs (Stevens et al., 2015). For instance, expansion in transportation and healthcare were the two largest career sector expansions for non-sponsor colleges. Both career sectors are in high-demand and require specialized training. Specific occupations identified include medical assistants, medical recorders (coders), medical secretaries, and truck drivers. Other occupations included barbers and hair stylists. All these occupations do not require an academic degree, but they all require an industry credential or license. Non-sponsor colleges could have quickly developed the required instruction through the non-credit side of the college to meet the demand. This is an example of where leadership may have also influenced expansion by supporting training outside of the classroom (Cai, 2018). The ability to influence change to meet demand supports the theoretical framework of Anderson's (2005) *Theory of Change*, outlined in chapter two. This theory focused on identifying change, addressing the change, and implementing the change, or in this instance a different training model.

The state a college is in may determine their role in apprenticeship programs. States that have State Apprenticeship Agencies (SAA) may regulate the role a college can have in registered apprenticeship programs. In the Northeast region, nine of the ten states are regulated through State Apprenticeship Agencies. Of the (11) community colleges represented in the Northeast region, only one is a sponsor (not applied), the remainder are non-sponsors. Non-sponsor colleges that reside in the SAA states and cannot grow beyond being non-sponsors, continued to build the necessary relationships with industry partners to help drive the education to meet the workforce demands (Browning & Nickoli, 2017).

Non-sponsor colleges did not have to commit the time or money that sponsor colleges had to invest to become a sponsor. The role of sponsorship includes several standards that need to be met, are time consuming, and take a large amount of time and effort to establish. The sponsor colleges had to invest time outside of just building industry relationships which are important for all colleges involved in registered apprenticeships (Holzer & Lerman, 2014; Decker, 2019), they also had to administer the programs, recruit, train, and find placement for the students with industry partners. These are not activities that a non-sponsor college has to be involved in, and these additional activities are costly and require funding. According to the literature, community colleges were not fully recognized or supported through funding to supplement the development as colleges being sponsors until 2014 (Craig & Bewick, 2017; Klor de Alva & Schneider, 2018; Loudenback, 2018; RACC, 2020). Since 2014, there has been a 128% growth increase, with an additional 705,000 new apprentices since the end of 2016, and 12,300 new apprenticeship programs created in the last five years (U.S. Department of Labor, 2021).

The physical location of a college is also a challenge, as colleges require collaboration with industry and having industry near them that are willing to participate in apprenticeship programs is critical (Garza Mitchel, 2017; Grosz et al., 2020). An urban location would give a college more choices in occupations to expand into, and the student population it may need to fill positions (Sublett & Tovar, 2021). Fewer industry partners mean fewer programs. Non-sponsor colleges had the most students and had representation across every occupation. Sponsor and sponsor (not applied) had less students and as a result did not have representation in every occupation. Fewer students mean less diversification in occupations.

There are both internal and external factors that influence the ability for community colleges to become involved in registered apprenticeship programs. The descriptive data supported the literature showing that when community colleges are partners in register apprenticeship programs, they have the ability to expand registered apprenticeship occupations due to colleges becoming more flexible (Stevens et al., 2015), allowing for academic credit and transfer of credits (Sack & Allen, 2019; O'Banion, 2018; Rosen et al., 2018), and overcoming internal issues such as funding, faculty involvement, and college leadership support (McGregor, 2019). Expansion of apprenticeship occupations also requires building strong partnership with industry (Grosz et al., 2020) and the capacity to be responsive to their workforce needs (Lowry & Thomas-Anderson, 2017; O'Banion, 2019; Tesfai, 2019).

There are many benefits to community colleges being involved in registered apprenticeship programs. For example, the *learn and earn* model has demonstrated a benefit to meet labor market needs for industry and meet the needs of students and that of community colleges (Browning & Nickoli, 2017). Community colleges play an important role in supporting students who are apprentices. For instance, colleges offer wrap around services and other programs which increase the success of students in the workforce (Klor de Alva & Schneider, 2018). Also, community colleges recruit, select, and prepare students for an apprenticeship program which increase retention for industry partners (Klor de Alva & Schneider, 2018), and students have a retention rate of 94% when placed in employment settings (Reed et al., 2018). Colleges can also leverage funding to offset the cost of an apprenticeship program, such as paying for books, tuition, and supplies (Klor de Alva & Schneider, 2018).

Secondary Research Question 2

What is the impact of community colleges becoming sponsors of registered apprenticeship programs on the number of women and diverse populations?

Diversification and Expansion of Women and Race

Since the mid-1980s, trade unions have been the main training sites for construction and manufacturing apprenticeship programs (Dimney et al., 2019), apprenticeship occupations really did not start to expand beyond construction and manufacturing until 2008, and still made up less than 4% of the workforce (Decker, 2019). These occupations have been heavily preferred by men. Women in this study represented 12% of the total population, but when compared to the total percent of women (9%) at the national level in apprenticeship programs (U.S. Department of Labor, 2020), it is a 3% increase. It seems that even though sponsor and non-sponsor colleges showed to be equally diversified in terms of women, in both cases the numbers are low. So, both groups must make efforts to recruit more women.

The most popular occupations for women when compared to men, include business and finance (69%) and healthcare (77%). While healthcare is a traditional occupation for women, business and finance is not as common. The Midwest region had the highest representation of women in healthcare, and this could be due to a couple of colleges located in this region, who have built relationships with healthcare employers to assist in the expansion of occupations to meet their workforce needs. This is one example of non-sponsors colleges working with industry to help design apprenticeship programs to meet their local workforce needs.

Women make up over 50% (AACC, 2020) of the student body at community colleges, movement into non-traditional gender occupations is not uncommon today among women.

Through apprenticeship programs, colleges create academic paths by developing economic opportunities linking individuals with employment opportunities (Kim et al., 2021). However, women have low recruitment rates and are less likely to enroll in apprenticeship programs (Dalporto & Tessler, 2020; Geaudry & Perry, 2020). Even though based on the literature, community colleges can provide support to apprentices that is not within the capacity of employers (e.g., wrap-around services, counseling, transportation, and childcare), colleges working with industry need to identify the barriers for women being placed in apprenticeship programs.

Community colleges enroll a large number of diverse populations, 56% to be exact (AACC, 2020), yet disparities still exist in registered apprenticeship programs (Estes & McCain, 2019).

This study did not show any statistical difference related to race and the three college groups. Considering that the minority population across the nation are predicted to reach 49% by 2050, industry does not reflect this representation of minorities in the workforce (Brown et al., 2005). It would be imperative for community colleges to use the program evaluation theoretical framework described in chapter two. Using a program evaluation model, such as the one developed by Spalding (2014) that utilizes formative data to evaluate apprenticeship programs can help determine whether program outcomes (like increasing diversity) were met. Focusing on increasing diversity in apprenticeship programs would ensure an equitable workforce.

Implications for Practice

Registered apprenticeship programs are an effective workforce strategy for community colleges as they increase student enrollment, retention, and completion rates. For industry,

registered apprenticeship programs are a strategy to meet the existing workforce demand. The industry and colleges collaboration ensures the provision of training to address the "skills-gap," as well as reducing recruiting costs and increasing job retention. For students, registered apprenticeship programs not only help them receive an academic and industry credential that is nationally recognized, but they also provide an opportunity in a career pathway, that includes a salary while earning a credential.

In 2019, with a low employment rate before the pandemic, there existed a "skills-gap" in the workforce to meet the demands required to fill jobs. Today, as the economy is recovering from the pandemic and the employment rate is still somewhat high (4.8%), there is a need for high-skilled laborers. The skills and occupations may be different than pre-pandemic, but there still exists high-wage, high-skilled jobs that need to be filled, such as, logistics, truck driving, cybersecurity, and others. Most of these occupations exist at community colleges as CTE programs and can be easily adopted to align with apprenticeship programs. Adopting the registered apprentice model could represent a fundamental reform that systematically could address chronic gaps that have bedeviled colleges. These could include an immediate labor market payoff for low-income, women, and diverse students, and the need for competency-driven and work-based learning on-ramps to new career-track occupations with industry engagement, and sustainability.

Non-sponsor colleges were more adoptable in their expansion into new occupations. This can only come from building strong relationships with industry, as industry drives apprenticeships. Several factors could have supported this expansion by non-sponsor colleges. Strong support from administration allowing capacity and time to explore and build relationships with new industry partners to determine their current and future workforce needs. Investment of

time and money in creating new curricula to meet these new occupations and skills. Offering incentives to student such as tuition reimbursement, childcare, flexible schedules or other benefits that would draw more students.

Community colleges serve a high percentage of women and diverse populations, which give them have a higher level of access to these two distinct populations. Colleges provide several wrap-around services that benefit these populations as it relates to retention, such as access to child-care services, transportation, financial assistance, and other assistance. These types of services can break down those barriers to success in registered apprenticeship programs, especially for women and underrepresented groups. With a demand from diverse student populations combined with several sector-based technical training programs; community colleges can increase the number of underrepresented groups (e.g., women and diverse populations) into the workforce (Dimeny et al., 2019). The results of this study showed that colleges need to do a better job in supporting and enrolling both women and diverse populations into registered apprenticeship programs. Further studies might amplify what those issues might be as it relates to the industry side of expansion and acceptance of these two populations, colleges also need to look internally at data and talk with students as to what might be the cause of these disparities.

Adopt a Strategic Focus on New Occupations

Access to resources is needed for community colleges to implement apprenticeship programs. Funding would support opportunities for community colleges to work with industry to expand occupations, especially in the new areas that have emerged from the pandemic, or the gap in occupations demonstrated through this study (e.g., construction and advanced manufacturing). Instructional design is time consuming and would require a commitment by both

the employer and the college. This funding could come from both the U.S. Departments of Labor and Education with a focus not only on new occupations but on educational pathways which provide an opportunity for women and diverse populations to complete the programs. This would support the Equal Employment Opportunity regulations that the U.S. Department of Labor released in 2016.

Colleges can expand apprenticeship programs, but they need to be more flexible in several areas to achieve this, as supported by the Theory of Change framework presented in chapter two. Apprenticeship programs have fewer hours in the classroom (144 minimum) compared to on-the-job training (2000 minimum). That would mean fewer hours at the college and more at the industry site. Through a collaborative agreement between colleges and industry, colleges could pay a user fee (or offset the cost) using the equipment required in the applied learning at the site of the industry partner. This could mean less equipment, replacement, and repair costs for the college. It would allow the expertise of faculty to mentor apprentices, supporting the Cognitive Apprenticeship Model Theory (Dennen & Burner, 2007). All of this could be done at the site of the industry partner. Being creative and innovative, community colleges could provide the mentorship for the on-the-job training at industry sites, and they could provide a varied face to face training model through online interactive platforms with a live instructor (e.g., mediated telepresence). This type of programming could provide colleges the ability to expand beyond just their communities, reaching students and industry partners in more rural regions.

Community colleges tend to include general education into programs and apprenticeship programs align with subjects that are directly related to the occupation or on-the-job training. For example, college faculty could look more closely at the skills required in an occupation and align

the general education programs that would support those skills. A math course that focuses on only the math skills required in an occupation could still be considered a general education course, but it is less broad and more focused on the required math skills.

Adjusting and realigning credit requirements in academic programs could better align with apprenticeship training programs. For example, colleges are already providing training in several different occupations through their career and technical education program. By cross walking curriculum with apprenticeship programs, they could repack and align their curriculum to apprenticeship programs while providing academic pathways for students.

The average age of a community college student is 28, and 65% of them are working part-time (AACC, 2020). Many are already acquiring skills in the workplace. By developing an assessment process (credit for prior learning), colleges can create a pathway for more students to enter college and into an apprenticeship program aligned with an academic pathway. This can increase more opportunity for adult learners, women, and underrepresented populations (Keily, 2019).

Colleges could benefit learning from other colleges, especially non-sponsor college who have already been involved in apprenticeship programs. AACC through the ECCA initiative, created a Virtual Apprenticeship Network Toolkit (VAN), a guide designed to assist colleges in designing, implementing, sustaining, and evaluating registered apprentice programs at a community college. This toolkit was created based on the feedback from the colleges involved in the study. Toolkits like these can assist colleges to build the support they need to expand into apprenticeship programs.

Limitations

This study identified several limitations such as the timeline of the study, the number of colleges involved in the study, and the self-reporting data collection in relation to gender and race.

An Expanded Timeline

This study only measured expansion of occupations within the timeline of 24 months, which is a short timeline for colleges to implement a new curriculum or approve a new program. All colleges have policies and processes in place when they are starting new programs or changing curriculum. Most of these processes take over a year. Even once approved, the colleges need to market the program, build relationships with industry, and recruit students.

The U.S. Department of Labor, Office of Apprenticeship, and the State Apprenticeship Agencies, also have policies and processes in place when creating a new apprenticeship program. This process may also take a year or longer for approval on registering a new apprenticeship standard. Combined, this timeline barrier may have caused a slowdown in the expansion of new occupations.

Race and Gender Identification

In this study, students self-selected their gender and race. There was a significant number of students who did not self -identify in the category of gender (1.4%) and in race (13%). In future studies broadening the gender and race categories which reflect the overall population on the forms that are filled out by students, might assist in resolving this issue so that more accurate data can be captured.

Consistent Oversight by the U.S. Department of Labor

As stated in the literature, all registered apprenticeship programs have standard training components that must be met. Inconsistencies occur due to the difference in state policies and procedures from those states that are State Apprenticeship Agencies (SAA). While SAA states register their programs with the U.S. Department of Labor, the oversight of registered apprenticeship programs are done at the state level. Each SAA state can determine who can be sponsors, how they will track the state apprentice information and several other related administering practices. This creates a decentralized system as it relates to management, tracking, and administration. These inconsistencies make it difficult for colleges to expand in some states and across states.

Recommendation for Future Research

This study was quantitative in nature, focusing on quantitative facts related to sponsorship states. Richer explanations could have been generated had this study included a qualitative research component. For example, surveying or interviewing community college administrators may have offered an understanding on how non-sponsor colleges were most effective in expanding the occupations offered.

Additionally, this study was conducted based on data that were captured from one single apprenticeship network, which reflected the relationship between a national association and that of their members. Only 31 states were represented in this study, expanding participation from all states including private two-year institutions would create a more representative pool of community colleges to better assess their occupations and diversification of students.

More research is needed to explore what type of programming or supports are needed to increase the enrollment of women and racially diverse populations into other occupations with registered apprenticeship programs. A qualitative study focusing on identifying the disparities that exist with women and racially diverse students, and what is causing those disparities would help answer the questions that came from this study. Other diverse populations to include, might be students with disabilities, and past or present incarcerated individuals.

Regional apprenticeship studies could explore which states are seeing new occupational growth, they could also assist in identifying where barriers exist. Through regional studies researchers could determine if State Apprenticeship Agencies and Office of Apprentice states make a difference in the expansion of new occupations. For example, are state policies set by SAA states hampering or supporting the inclusion of community colleges related to the expansion of occupations, women, and diverse populations? They could also explore the barriers, to evaluate what is needed for further expansion.

There are revenue benefits to hiring an apprentice for an employer such as reduction in employee turnover, less recruitment costs and higher productivity. There are also revenue benefits to the apprentice themselves who are earning wages and benefits, along with knowledge. A study that would examine the return on investments for colleges as it relates to direct revenue, could demonstrate the significance to college leaders beyond the development of career pathways and strengthened employer partnerships.

Conclusion

As the director of the AACC, ECCA initiative, the researcher experienced first-hand the value that this learning strategy brought to adult learners who wanted the direct pathway from

college to the workforce. The researchers' compassion for higher education along with the value she has seen through registered apprenticeships helped direct the researcher to this research approach. The researcher also realized that there is limited research on college sponsorship related to registered apprenticeships which could bring value, especially today as we look at an overall economic recovery.

This study sought to determine the effect community colleges that were eligible to be apprenticeship program sponsors had on the growth and expansion of registered apprenticeship occupations as well as on the number of women and racially diverse students. The findings of the study showed the value that community colleges bring to the communities where they operate as registered apprenticeship sponsors and non-sponsors influence the expansion of occupations. Women were found to be enrolling at higher rates at sponsor and non-sponsor than at sponsor (not applied) colleges. Across colleges there was no difference in the number of racially diverse students. Registered apprenticeship programs are a workforce strategy that provide opportunities to all the partners involved and these will continue to expand across the United States. The overall benefits to students, industry, and participating colleges greatly justifies the continued expansion in order to meet the needs of todays and tomorrow's workforce.

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Institutional Review Board

MINNESOTA STATE UNIVERSITY MOORHEAD

DATE:	January 21, 2021
TO:	Ximena Saurez-Sousa, Principal InvestigatorAnne Hoeltke, Co-Investigator
FROM:	Lisa Karch, Chair Minnesota State University Moorhead IRB
ACTION:	**DETERMINATION OF EXEMPT STATUS**
PROJECT TITLE:	[1672062-1] Impact of Community College's Related to RegisteredApprenticeships
SUBMISSION TYPE:	New Project
DECISION DATE:	January 11, 2021

Thank you for your submission of New Project materials for this project. The Minnesota State University Moorhead IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations under 45 CFR 46.104.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact the Minnesota State University Moorhead IRB. Please include your project title and reference number in all correspondence with this committee.

This letter has been issued in accordance with all applicable regulations, and a copy is retained within Minnesota State University Moorhead's records.

AMERICAN ASSOCIATION OF COMMUNITY COLLEGES

September 16, 2020

Minnesota State University Moorhead
Attn: Institutional Review Board Committee
1104 7th Avenue South
Moorhead, MN 56563

To Whom It May Concern:

I understand that Ms. Ann Hoeltke is enrolled in the Minnesota State University Moorhead Educational Leadership Ed.D. program and will be working on her dissertation on the topic entitled, "Expanding Occupations Through Community College Registered Apprenticeships." Ms. Hoeltke has requested to utilize data collected during the implementation of the Expanding Community College Apprenticeships (ECCA) Initiative; a project run by the American Association of Community Colleges (AACC) for her study. I have been assured by Ms. Hoeltke that all data gathered through the association's ECCA initiative will be presented in aggregate, not disaggregated. Ms. Hoeltke has received my permission to use the ECCA data to complete her dissertation study. The data cannot be used for any other purposes without prior written permission from AACC.

In addition, we acknowledge that this study poses no physical risk to any participants involved in the ECCA initiative. All the information gathered for this dissertation study will remain confidential and I am assured by Ms. Hoeltke that it will only be used for the purpose of her study.

Sincerely,

Walter G. Bumphus, Ph.D.
President and CEO

One Dupont Circle, NW ■ Suite 700 ■ Washington, DC 20036 ■ T: 202.728.0200 ■ F: 202.223.9390 ■ www.aacc.nche.edu

Table of Random Numbers

36510	36777	89116	05542	29705	03775	21564	01630	27973	62413	05652	62817	57801
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84180	93793	64953	51472	65358	23701	75230	47200	78176	85248	90589	74567	22633
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76418												