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A Workforce Development Study to Explore Current Demand for Industry-Recognized Credentials

Debra Kay Smiley
Old Dominion University

A WORKFORCE DEVELOPMENT STUDY TO EXPLORE CURRENT

DEMAND FOR INDUSTRY-RECOGNIZED CREDENTIALS

by

Debra Kay Smiley
B.S. May 1982, Longwood College
Different first page
M.S. May 2001, Central Michigan University

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Approved by:

Shana Pribesh (Director)

Dana Burnett (Member)

Mitchell R. Williams (Member)

ABSTRACT

A WORKFORCE DEVELOPMENT STUDY TO EXPLORE CURRENT
DEMAND FOR INDUSTRY-RECOGNIZED CREDENTIALS

Debra Kay Smiley
Old Dominion University, 2018
Chair: Shana Pribesh, Ph.D.

In this descriptive research study, I identified industry-recognized workforce credentials that are or will be in high demand by employers operating in Virginia. I surveyed a targeted group of Virginia workforce development stakeholders including 17 Virginia Community College System workforce development leaders who represent each local community college, 47 Virginia local and regional economic development directors, and 11 Virginia Workforce Innovation Opportunity Act directors. Due to the economic disparity between rural and urban areas, I also examined the contrast between high-demand credentials needed by employers in rural and urban areas.

The findings revealed that the top two industry-recognized credentials were health care and manufacturing, equally in high demand currently and predicted to remain so in the future. This finding represents a significant contrast with earlier research, which indicated that manufacturing lagged behind health care. In health care, respondents identified the specific credentials such as certified nursing assistant, licensed practical nurse, and registered nurse. For the manufacturing field, credentials such as machinists, welders, and maintenance technicians were identified. The urban respondents differed from rural and suburban participants in believing that health care was the most important, although this difference was not statistically

significant. Funding and facilities were noted as barriers to delivering high-demand workforce credentials.

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DEDICATION

This dissertation is dedicated to those closest to me. Thank you to my wonderful husband, Johnny, for his unconditional love, support, devotion, and companionship when traveling to exotic places.

To my beautiful, fun-loving daughter, Dixie, who may have complained about the books and papers strewn throughout the house but who thoughtfully gave me jewelry as a good luck charm to help get me through the dreaded ODU doctoral comp exam.   For her devoted friendship, I must recognize Teresa for her strong support during the demanding requirements of a doctoral program.

As an animal lover, I would be remiss not to thank my furry friends. Thanks to my "snuggle bunny" and best bud, Frankie, a rescued orange tabby cat from the SPCA, for much-needed snuggle time. Frankie had a knack for keeping me on task writing in my office chair because he insisted on sleeping in my lap. Thanks to Flo, a stray gray tabby cat rescued in 2015, for even more snuggle time and feline support. Thanks to my equine friends who were adopted from an equine rescue center in Pennsylvania in 2017: Symba, a 16.1 hand American Saddlebred horse; Merle Haggard, a red miniature horse; and Willie Nelson, a dapple-gray miniature horse.

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CHAPTER I

INTRODUCTION

Community colleges are the primary provider of noncredit credential-focused training for the workforce in some states (American Association of Community Colleges [AACC], 2017). A credential is defined by the New Economy Workforce Credential Grant (2016) as a portable competency-based third-party validated industry certification. Both individuals and employers benefit from this training resource. In 2016, as many as five million students were enrolled in noncredit credential-focused community college courses (AACC, 2016). According to an AACC (2016) analysis of the Integrated Postsecondary Education Data System (IPEDS) Fall 2014 Enrollment Survey, approximately 12.3 million students were enrolled in community colleges in the Fall of 2014, which means that approximately 40% of that enrollment was noncredit credential focused enrollment (p. 1). Clearly, these credential programs are playing a substantial role in community college education.

The Virginia Community College System (VCCS) develops relationships with employers to identify and meet employer training needs (JLARC, 2017). According to the VCCS impact page, VCCS served 13,199 employers in fiscal year 2016/2017 by providing customized and open enrollment training, facilities use, and other contractual services (http://www.vccs.edu/about/where-we-are/impact/). The Vice Chancellor of Workforce Development for the VCCS supports research (such as this study) that collects data that will help workforce development stakeholders meet the job skill needs of employers across the state of Virginia (Craig, 2014).

In Virginia, the VCCS offers credential-based, high-demand workforce development training programs that are approved by the VCCS systems office and Virginia Council for Workforce Development (New Economy Workforce Credential Grant Program, 2016; VCCS, 2017a). These high-demand credentialing programs are also approved for partially subsidized tuition support through the Workforce Credential Grant (WCG) (New Economy Workforce Credential Grant Program of 2016). Since the implementation of WCG, the VCCS has rebranded WCG as FastForward programs (See https://www. fastforwardva.org/). In the VCCS, workforce development programs vary from one community college to the next. The VCCS approval process requires each individual community college to submit justification of local demand for credentials to be considered for WCG approval. Each community college must submit regional Labor Market Information (LMI) and evidence of business engagement that a credential is in high demand for an occupation supported by the proposed credential. Virginia LMI includes but is not limited to projected job growth, number of job postings, the intensity of job postings, salary data, and age of incumbent workforce, which helps determine the need to replace retiring workers. Business engagement documentation includes validation of the need for each credential by regional employers which includes, but is not limited to, current and future demand for occupations. Validation of business engagement is evidenced in several ways including letters of support from employers and commitments to support or interview graduates. If the VCCS systems office staff supports advancement for WCG funding, a formal request, which includes a high-level summary of demand for the credential, is submitted to the VCCS State Board for Community Colleges for approval.

As a result, the VCCS has a list of approved WCG programs for each of the 22 community college workforce development divisions (VCCS, 2017a). The list helps workforce

development stakeholders and individuals identify existing WCG high-demand noncredit credential-based programs. However, it does not include needed programs that each individual community college cannot yet offer in its service area (See VCCS, 2017a).

In general, VCCS is succeeding in offering programs for credentials in high demand by employers, but there are many examples of unmet needs (JLARC, 2017). There are gaps, especially in certain regions of Virginia, between the short-term noncredit credentialed programs offered at some community colleges and high-demand credentials currently needed by local employers for which an application for WCG approval has not yet been submitted (Joint Legislative Audit and Review Commission [JLARC], 2017). For instance, Rolls Royce North America, which is headquartered in Reston, Virginia, recently announced that their Rolls Royce Crosspointe production facility, located in Prince George, Virginia, plans to hire approximately 100 additional workers in 2018. Due to an increased demand for aircraft components, most of the workers will need a high-tech skill set in computer numerical controlled (CNC) milling that can be verified through National Institute for Metalworking Skills (NIMS) credentials and/or mechatronics that is verified through Siemens credentials (Blackwell, 2018). According to the VCCS list of WCG approved credential-based programs (2017a), community colleges that serve the Prince George area do not currently offer WCG approved short-term, noncredit credential-based programs that include CNC milling credentials verified through NIMS nor mechatronics credentials verified through Siemens. They may offer these credentials through courses for academic credit, but they do not offer NIMS and Siemens credentials on the short term, noncredit basis that help people seeking either to start or advance their career to meet employers' demands for credentials in a timely way. In another example of supply not meeting demand, administrators at Rappahannock Community College (RCC), which serves 12 counties, used

local economic development reports, employment listings, and informational discussions to determine that automotive mechanics with Automotive Service Excellence (ASE) credentials are in high demand by employers in their service area (J. Perry, personal communication, June 14, 2018). Although the VCCS and individual community colleges such as RCC are reviewing labor market demand for credential-based programs they could offer and communicating with employers regarding their training needs, there has not been a broad study of workforce credential needs since 2009 (Landon).

There will be new, high-demand credentials that are not yet identified by employers. According to Burrus (2014), technology is transforming swiftly; as it changes, it not only eliminates jobs but also creates them. Educators need to be forward thinking to train workers for credentials needed in the future (Burrus, 2014). Recognizing the need to invest in the workforce now so Virginia is prepared for the economy of tomorrow, the former governor, Terry McAuliffe, promulgated Executive Order No. 23 (2014) establishing the New Virginia Economy Workforce Initiative to encourage educators to meet employers' demands today and in the future for workers with specific credentials. Since the statewide legislative initiative was implemented, administrators at community colleges seem more focused on providing credentials that employers need now (JLARC, 2017). As evidenced by the fiscal year 2016/2017 VCCS workforce annual report supplement, credential attainment through short-term workforce development programs funded by WCG has shown impressive results. However, the focus on present needs has obscured attention to future needs, which may be a legacy of inconsistencies in statewide workforce development programs that existed in the past. Prior to the implementation of Executive Order No. 23 (2014) and WCG (New Economy Workforce Credential Grant Program, 2016), Virginia noncredit workforce development training programs in Virginia varied

in price, length of training for similar programs, and the rigor of instruction (JLARC, 2014).

Additionally, these workforce programs were less focused on short-term industry-recognized

credentials needed by employers (JLARC, 2014).

The Virginia Board of Workforce Development made a recent call for action to equip

workers for future credential needs. In the 2017 Annual Report for the Virginia Board of

Workforce Development, Dunnigan asserts that "The Virginia Board of Workforce Development

is charged with identifying high-demand occupations, with an eye on Virginia's economic

development priorities and the projected employment needs of industry" (p. 6). Focusing on

future credentials needed by Virginia business and industry for occupations in high demand will

help the Board to meet Virginia's workforce needs (Dunnigan, 2017).

In keeping with that call, this study focuses not only on present unmet needs but also on

the needs of employers in the future; thus, this study's findings could contribute significantly to

workforce development initiatives. The results will highlight industry-recognized credentials

needed in the next five years that may warrant training programs of their own. The need for new

credentials may result from emerging technologies, expansions, or influx of new industry to local

regions. Employer credential needs identified through this research may encourage local

community colleges and economic development stakeholders to collaborate to implement

cutting-edge programs that could attract new business and industry in the future.

Background of the Study

To develop and deliver training programs that are in high demand today and in the future,

community colleges are searching for requisite financial resources at the state, regional, and local

levels (D'Amico, Morgan, Katsinas, & Miller, 2017). State support for credential education may

provide an incentive for community colleges to deliver open-enrollment, credential-based

occupational training (D'Amico et al., 2017). Financial support for noncredit training varies

from state to state (Katsinas, D'Amico, & Friedel, 2012). In 2012, a national survey of each

state's member of the National Council of State Directors of Community Colleges revealed that

41 states were providing some level of financial support for higher education institutions to offer

training that leads to manufacturing credentials (Katsinas et al., 2012). In their responses to the

national survey, 41 state representatives indicated that training that leads to manufacturing

credentials was a high priority in meeting employers' job skill needs (Katsinas et al., 2012).

Such job skill needs include industry-recognized credentials in information technology and

welding (Katsinas et al., 2012).

The Virginia General Assembly approved innovative tuition support for VCCS noncredit,

high-demand, credential-based short-term programs offered through workforce development

programs (New Economy Workforce Credential Grant Program, 2016). Virginia's unique

tuition support can pay up to two-thirds of the cost of full tuition for students who qualify (New

Economy Workforce Credential Grant Program, 2016). The concept is based upon the premise

that students are more invested in a training program if they are required to pay a portion of the

tuition cost (Gasskov, 2006). Therefore, Virginia students are expected to pay one-third of the

full tuition cost at the time of registration. The local community college can invoice the State

Council of Higher Education for Virginia (SCHEV) for the remainder of the cost—the second

third of tuition when a student completes the coursework, and the final third when the student

passes the required industry-recognized credential aligned with the course.   The financial

support that the WCG provides for workforce development training has led to a significant

increase in noncredit students who have earned high-demand credentials through workforce

development training in Virginia (State Council of Higher Education for Virginia, 2018). In the

2016-2017 fiscal year, 3,072 students out of 4,961 students who enrolled in WCG training programs earned high-demand credentials with a 62% pass rate (State Council of Higher Education for Virginia, 2016). Compared to the latest available Fall 2013 cohort pass rate of 26.3% for VCCS credit programs (VCCS Cohort Graduation and Pass Rates, 2018), the 62% pass rate for students enrolled in VCCS WCG approved training programs is impressive.

Even with the implementation of WCG funding, demands for some credentials in some regions remain unmet (JLARC, 2017). According to Virginia's JLARC report (2017), allocation of VCCS funds for WCG programming was not prioritized as intended by the General Assembly. Further, the lack of resources such as facilities, software, technology, equipment and support staffing have had a direct impact on the ability of individual VCCS community colleges to deliver credential-based programs (JLARC, 2017).

The student demand for WCG programs exceeded the designated amount of financial support set aside for both the 2016/2017 fiscal year and the 2017/2018 fiscal year (State Council of Higher Education for Virginia, 2016, 2018). Focusing on the positive aspects of high demand, Virginia General Assembly Delegate Kathy Byron, who sponsored legislation to create the WCG program in 2016, boasted about the success of the program and how it has exceeded expectations, adding, "This program is changing lives and transforming our workforce as a result" (Ashford, 2018, para. 3). According to Byron, the Virginia General Assembly recently decided to increase WCG funding by 25%, allocating $19 million for the next two years in order to address the increasing demand for WCG funds (Ashford, 2018).

The General Assembly seems committed to allocating more funding for the popular WCG tuition remission program, but funds available through internal budgets to develop new non-credit community college programs are limited (JLARC, 2017). Due to a lack of resources,

some VCCS community college workforce development divisions cannot offer adequate high-demand credentialing programs to meet employers' needs in their region (JLARC, 2017). To receive VCCS approval for WCG tuition support for a high-demand credential program, a community college in Virginia must first have the resources (e.g., dedicated staff, classroom space, infrastructure, faculty, technology, and equipment) needed to offer the credential-based training through workforce development divisions (JLARC, 2017). Despite evidence that the demand for specific credentials is unmet in their service area, many workforce development departments at community colleges in Virginia are unable to deliver credential-based programs needed by employers (JLARC, 2017).   Examples of some programs that are not delivered in some community college service areas include "certified nursing assistants, emergency medical technicians, pipefitters, and welders" (JLARC, 2017, p. 80).

Due to declining enrollment, state financial support for higher education is shrinking (Mortenson, 2012), and community colleges are put in the precarious position of allocating limited resources to meet expanding needs. Even though some states have increased funding toward workforce development credential-based programs, overall funding for community colleges has declined (Mortenson, 2012). This trend in shrinking support for community colleges is likely to continue; research conducted by Mortenson (2012) revealed that state support for higher education could be as low as zero by the year 2059. Thus, community colleges are eager to find alternative financial sources, such as fundraising and grants, to support new training initiatives (Murray, 2010). Rural colleges in southern and southwest areas of Virginia may apply for educational grant opportunities through the Tobacco Region Revitalization Commission (https://www.revitalizeva.org/grant-loan-program/) or reallocate funding within the college's existing, limited budget. Even though some VCCS high-demand credential-based short-term

noncredit programs have already been approved for the WCG and implemented at each of the VCCS community colleges, more research is needed to develop an up-to-date, nuanced, comprehensive list of current and future demands for short-term noncredit industry-recognized workforce credential-based programs in Virginia. Due to the lack of resources, some community colleges cannot develop new credential-based workforce development programs to meet the needs of local employers (JLARC, 2014; JLARC, 2017). An updated comprehensive list of credential-based programs needed by employers in Virginia provides more data which can help workforce development stakeholders collaborate to seek funding to meet program needs. The research will also differentiate credentialed programs needed among rural and urban areas which can support the Rural Horseshoe's efforts to improve economic development in rural regions.

Although updating and expanding the list of short-term, noncredit industry-recognized workforce credentials in demand of employers will not remedy the funding challenges faced by Virginia or specific community colleges within the VCCS, it may help lawmakers and community college administrators obtain outside funding or justify reallocations of funding. Additionally, a more comprehensive list of short-term credential-based programs needed by employers will provide data that may motivate workforce development stakeholders to collaborate to develop such programs to meet employer demands on a timely basis.

In addition to updating the list of short-term credential-based programs, research on what credentials are being demanded most needs to be updated. In 2009, Landon found that the highest demand for credentialed skilled workers occurred in the health care industry. However, Landon's (2009) data are more than ten years old. Ostensibly since Landon's (2009) study, the need for health care services has risen because the Affordable Care Act allowed more people to access services and because the baby boomer generation is aging and needing more health care

services (Woods, 2013). The hypothesis that the health care industry still demands more skilled credentialed workers than any other industry may be supported, but more evidence is needed to confirm or challenge that idea. It is possible that there are other high-demand credentials that are being masked by the emphasis on health care credentials. This research will provide new data regarding the current and future demand for particular workforce credentials by Virginia employers; thus, it will update and extend (but not replicate) Landon's (2009) study.

I compared workforce credentials in high demand amongst rural and urban regions (JLARC, 2017). In rural areas, community colleges play a vital role in the area of workforce and economic development; they build human capital, and human capital, in turn, attracts economic development (Malecki, 2003). Individuals living in rural areas may seek training at local community college training programs due to their close geographic proximity (Mykerezi, Kostandini, & Mills, 2009). A job-related industry-recognized credential is the most pertinent determinant of increases in workers' long-term earnings (U.S. Dept, of Labor, U.S. Dept. of Commerce, U.S. Dept. of Education, & U.S. Dept. of Health and Human Services, 2014). There are also economic benefits for the community. Even though rural areas are at risk of losing some human capital to more urban areas, a significant number of community college students stay in place, thereby contributing to the local economy (Malecki, 2003). Noncredit, high-demand credential-based programs at community colleges may contribute to employment in rural areas both by increasing program participants' qualifications for jobs and by attracting new businesses seeking to take advantage of access to credentialed workers (Campbell, 2014). Individuals with workforce credentials also rely less on welfare and social support because they have higher wages and better benefits (Hall, 2016), so the workforce training provided by community colleges may indirectly help the local economy in that way.

To increase local individuals' credentialed skill levels, rural areas with limited resources and limited technology need financial resources to invest in education and training (Beasley & Holly, 2013). Without enough financial resources, rural areas are limited in their ability to train workers and allow them to earn the industry-recognized credentials that many employers require. Virginia's state support for community colleges has been reduced to a low of 40% (http://www.vccs.edu/giving/); thus, rural community colleges are driven to seek funding from alternative sources such as federal and state grants to develop and deliver new training programs (Murray, 2010).

Unlike rural areas, metropolitan areas typically have more robust economies that offer more infrastructure resources to invest in workforce development such as internet services, transportation systems, housing, and more higher education institutions that offer diverse training programs. Metropolitan areas attract businesses in advanced manufacturing, industry, and research and development with their transportation systems, information technology, and communication networks (Gibbs, Kusmin, & Cromarte, 2005). Because of the disparity of resources between rural and metropolitan areas, metropolitan areas can offer more access to industry-recognized credentials through extensive training programs. Virginia's demographics include diverse populations ranging from impoverished rural mountainous regions to flourishing metropolitan regions in Northern Virginia, so the Commonwealth of Virginia is an ideal place in which to study workforce employers' current and projected demands for credentials.

Statement of the Problem

The problem targeted in this descriptive research study is to identify the current and future industry-recognized workforce credentials in high demand by employers in Virginia as noted by VCCS workforce development leaders, Virginia local and regional economic

development directors, and Virginia Workforce Innovation Opportunity Act (WIOA) directors. This research provides data designed to assist stakeholders with the development of strategic workforce training plans and efforts to access additional internal and external financial sources to support such plans. These strategic plans will support community colleges in developing and delivering training programs that result in industry-recognized credentials that may be valuable not only today but also in the future. This research will also provide data about high-demand credentials in both rural and urban areas that stakeholders can use to compare needs for current and future VCCS credential training initiatives.

Currently, high-demand, industry-recognized credential training is limited to formally approved programs (8 Va. Admin. Code § 40-160, 2017). Colleges will not seek VCCS approval for industry-recognized credential training programs for which they lack the necessary resources to develop and deliver; thus, the resources of colleges affect employers' access to workers with desirable credentials (8 Va. Admin. Code § 40-160, 2017). Some credential-based programs are expensive to deliver because they require costly equipment, support staff, qualified instructors, software, technology, and facilities (JLARC, 2017). Expensive training programs include welding, truck driving, machining, certified nursing assistant, medication aides, asphalt construction, pharmacy tech, cybersecurity, and machining (VCCS, 2017b). Community colleges cannot offer some noncredit short-term credential-based programs because they cannot justify the expense of such costly training programs (JLARC, 2017). Stakeholders can use the comprehensive list of high-demand credentials resulting from this research to make a case for financial support from internal and external resources.

According to D'Amico, Morgan, Katsinas, & Miller (2017), there has been limited research on the drivers for noncredit enrollment in community colleges, and this includes

noncredit workforce development programs. That gap has existed since at least 2009, when

Landon (2009) studied current and emerging trends impacting workforce development training

in Virginia and called for further research:

> Further study on professional development opportunities is necessary to fill the gap
>
> between reflection on the emerging trends and issues and the actions needed to add real-
>
> world, specific, innovative resources to present training and development services that
>
> strategically build a skilled workforce that contributes to economic progress. (p. iii)

This research meets that call for further research, identifying high-demand, industry-recognized

credentials that employers want employees to have now and in the future.

Landon (2009) conducted her research toward the close of the Great Recession, which

ended in June 2009 (Mishel, Lawrence, Bivens, Gould, & Shierholz, 2012). Immediately

afterward, in July 2009, the National Bureau of Labor Statistics (2009) reported unemployment

rates in 22 states were above nine percent. Since then, the economy has been improving, and

employment has been rising (Katsinas et al., 2012). The National Bureau of Labor Statistics

(2012) reported only nine states with unemployment rates at or above nine percent. In July 2017,

the national unemployment rate was 4.3%, indicating that the economy had improved

significantly since the Great Recession (National Bureau of Labor Statistics, 2017). The Great

Recession had a negative impact on the demand for credentialed workers in the construction field

(Henderson, 2016). Now that the Great Recession is over, the demand for credentials needs to

be re-evaluated. Landon (2009) discovered the health care industry had the highest demand for

industry-recognized workforce credentials, but Landon's study was conducted almost ten years

ago. I anticipated that the health care industry still has the highest demand for industry

recognized workforce credentials because the demand for health care services by the baby

boomer generation has increased and implementation of the Affordable Care Act (ACA) has given people greater access to health care (Woods, 2013). This study determined whether health care services are in highest demand and whether the demand for other credentials has potentially increased as well. Contemporary research related to the demand for industry-recognized credentials are also needed because the requirements of employers are changing as a result of technological advancement, global competition, and an aging workforce that will be replaced (O'Lawrence, 2017). Current data collected to extend the nine-year-old data collected by Landon (2009) helps to identify high-demand industry-recognized workforce credentials that Virginia employers in both rural and urban areas need and value in employees today and in the future.

The economic disparity between rural and metropolitan areas can also impact employer access to employees who possess the required job skills and industry-recognized credentials (Gibbs et al., 2005). Rural areas often have limited technology and financial resources that inhibit implementation of training in high-demand skills (Gibbs et al., 2005). In contrast, metropolitan areas have more of an influx of business and industry that fosters economic growth in their region (Gibbs et al., 2005). This economic growth enables metropolitan areas to develop and deliver workforce development programs that allow participants to earn credentials being sought by employers (Gibbs et al., 2005). Individual workers who earn industry-recognized credentials tend to earn higher wages based on their advanced skills (United States Dept. of Labor., 2014). Since there is a variance of access to job skills training between rural and metropolitan areas, I will consider the geographic region as a variable in this descriptive study. High-demand industry-recognized credential training is currently delivered through VCCS workforce development departments with the support of WCG funding. For a community

college to deliver WCG approved training, each college must request formal approval from

VCCS systems office and Virginia Council for Workforce Development. However, for a college

to even consider offering a new high-demand workforce development program, it must have the

proper tools in place to initiate such new programs (VCCS, 2017b). Tools such as equipment,

qualified instructors, supplies, technology, facilities, and software can be very expensive and cost

prohibitive (VCCS, 2017b). As such, the colleges' lack of resources for delivering specialized

training directly impacts employers' ability to hire skilled workers with verified credentials.

Educators who teach career and technical education can use the results from this research to help

meet the current and future training needs of employers across the country.

Purpose Statement and Research Goals

The aim of this research was to identify the high-demand, industry-recognized credentials

needed currently and in the future by employers in Virginia. The needs of employers directly

affect future workforce development services provided by educators in Virginia (New Economy

Workforce Credential Grant Program, 2016). The research will seek to identify these credentials

through the lens of stakeholders to include VCCS workforce development leaders, Virginia local

and regional economic development directors, and Virginia WIOA directors. Each of these

stakeholder groups works directly with employers to help meet the credential training needs of

employers. These stakeholder groups are experts in the workforce development field, and

collectively they work directly with employers to help meet credential skill needs of employers

and provide some level of tuition support for both individuals and employers. Each group is

knowledgeable of employers' demand for industry-recognized credentials in their respective

regions.

The following research questions guided this study:

1. What industry-recognized workforce credentials are currently in high demand by Virginia employers, and what industry-recognized workforce credentials are likely to be in high demand in the future?

    a. Are workforce credentials in the field of health care currently being demanded most by Virginia employers, and will they likely be demanded most in the future?

2. What industry-recognized credentials are currently in demand of employers based on stakeholder type?

3. How do current and future demand for industry-recognized workforce credentials compare amongst rural and urban regions of Virginia?

The answers to these research questions provide more data about Virginia's current and future demand for industry-recognized credentials. This research provides valuable workforce development knowledge for local, state, and national stakeholders. Since Virginia's Executive Order No. 23 (2014) mandates implementation of workforce credential training to meet the demand for current and future jobs, additional research about the demand of employers for industry-recognized credentials is beneficial for stakeholders. The VCCS systems office and Virginia workforce development stakeholders may benefit from this research since it provides valuable new information (C. Herndon, personal communication, 2018).

Significance of the Study

Traditionally, the term "workforce development" has referred both to noncredit training delivered to individual job seekers and to customized training delivered to business and industry employees as continuing education (Myran & Ivery, 2013). However, workforce development today is more holistic; it includes all the strategic initiatives of a college that contribute to

training a highly talented and educated workforce (Myran & Ivery, 2013). Regions that have

such a workforce are better poised to grow economically (Myran & Ivery, 2013).

Having current data describing high-demand workforce credential training needs can help

workforce development stakeholders collaborate to deliver training. To strengthen communities'

economic development, both employers and other stakeholders must collaborate and invest time

and resources to build a well-prepared workforce (Jurmo, 2011). The global economy requires

employees of businesses and industries to have core skills and knowledge that can be applied,

quickly upgraded, and adjusted in a rapidly changing array of employment settings (Chandler,

2011). To compete on a global scale, the United States needs a skilled labor force (O'Lawrence,

2017). Training workers to become credentialed in high-demand skills is essential to a vital

economy (O'Lawrence, 2017). Earning stackable credentials—that is, several credentials in a

specific field of study—allows workers to increase their potential to earn higher wages in the job

market (Carnevale, Jayasundera, & Hanson, 2012). The findings of this research study may be

used to develop a more comprehensive list of noncredit, short-term industry-recognized

credentials in high demand by employers. The research results give a clearer snapshot of types

of credentials needed by employers in rural and urban areas, and workforce development

professionals can collaborate to use the data strategically. For instance, the data may be

instrumental in supporting efforts by administrators of rural community colleges to obtain

financial support through grants. Such outside funding might then be used to purchase

equipment and supplies, hire qualified instructors and support staff, and obtain necessary

classroom space for new programs.

Overview of the Methodology

Through descriptive research, I answered questions related to current and future high-demand credentials that employers in rural and urban areas require of employees. The advantages of utilizing a descriptive research approach are rapid results and economy of design (Creswell, 2009). Through the distribution of an online survey instrument, I collected both quantitative and qualitative data. The cross-sectional survey was distributed with the intent to collect data at a specific point in time. Prior to officially launching the online survey instrument, a pilot group of ten workforce development professionals examined the research tool in order to provide critical feedback regarding clarity of questions. (Participants in the pilot group were excluded from participation in the official survey.) The survey instrument included both closed-ended Likert scaled questions and open-ended questions. The sample that participated in this study included 17 VCCS workforce development leaders, 47 Virginia local county and regional economic directors, and 11 Virginia WIOA directors. To avoid "coverage error" and ensure validity, a goal of a 50% response rate was established (Dillman, 2000). Lack of response from survey recipients can lead to nonresponse bias which can negatively impact the validity and reliability of the research. One way to deal with nonresponse bias is to weight the survey response sections to represent the attributes of the larger population. Thus, the survey response sections were weighted as needed to compensate for any nonresponse bias.

I analyzed the quantitative data by means of descriptive statistics and Chi-square tests. I further analyzed qualitative data by coding and sub-coding to determine themes. After initial analysis was completed by the co-researcher and me, an auditor further reviewed the coding process and how responses were coded to ensure consistency. The descriptive survey research results were organized and presented by describing variables, relationships between variables,

distributions of central tendency (mean, median, or mode), variable measures of range, and standard deviation. Participant responses were categorized based on geographic area, stakeholder group, and the number of years' of experience in workforce development; data were analyzed using Chi-square tests which assesses the relationship level between two categorical variables (Bracey, 2003). Frequency distributions are shown in tables.

A co-researcher and auditor helped me manage the data collected. The co-researcher did the following things: assisted me with interpreting and coding raw qualitative data into themes, and helped me to compare results of the auditor's analysis to assess the inter-rater reliability. The auditor's work included examination of the coded raw data to protect against the introduction of subjective bias in the analysis and coding of data. The auditor reviewed discrepancies with me to determine if qualitative responses were placed in the best category.

Research Limitations

This study had various limitations. One limitation was the possibility that members of the targeted population were new to their job. As such, survey recipients who were new to their job may have limited knowledge of how to respond to survey questions. Additionally, some leaders and directors may be more directly involved than others with employers in their respective service areas. Thus, another limitation is that some leaders and directors may be able to provide more knowledgeable survey responses than other leaders and directors. A limitation may result from the time commitments of the surveyed stakeholders. According to Delva, Kirby, Knapper, and Birtwhistle (2002), time-constrained surveys may be problematic for survey recipients who struggle with time constraints. Survey recipients may have replied to the survey since they felt overworked (Delva et al., 2002). Survey recipients may not have thoughtfully and thoroughly completed the survey if they were busy and overworked (Delva et al., 2002).

I collected data from active workforce development professionals employed at the time when the survey instrument was ready for deployment, targeting for specific positions. If the position for a targeted leader or director was vacant, the data might suffer from a lack of response or—if an alternate person filled out the survey—the data might not be commensurate with the data collected from other respondents in the intended position. Further, an obvious limitation of this study is that Virginia employers were not included in this survey. I did not include Virginia employers in this study due to the lack of a comprehensive list of Virginia employers. I also anticipated a low response rate from an electronic survey distributed to employers across Virginia.

Since the author is employed by one of the community college institutions within the VCCS, the potential for bias exists. Even though personal bias can never be fully excluded, the researcher took steps to help alleviate bias as much as possible (Plano Clark & Creswell, 2010). One such step is through the process of bracketing whereby the researcher sets aside his or her own pre-conceived notions or bias about the topic of research (Plano Clark & Creswell, 2010). During the research process, the use of bracketing helped me to alleviate personal views from being incorporated in the study. According to Husserl (1964), a researcher must be objective by extracting personal perceptions and experiences from the research study. I implemented bracketing by identifying bias and knowledge prior to the beginning of the research and took notes during the entire research process to document thoughts. Finally, I prepared a final report to document bracketing of bias or pre-conceived notions. This process allowed readers to evaluate my objectivity in the final product. As mentioned, a co-researcher coded, and sub coded the qualitative data alongside me. A different person served as the auditor who

reexamined the audit trail to assess the limits to which the co-researchers completed a rigorous study (Hays & Singh, 2012).

Delimitations

Delimitations are boundaries set by the researcher so that goals can be reasonably met (Hays & Singh, 2012). A variety of Virginia workforce development stakeholders were surveyed in this high-demand workforce credential study. A delimitation established by the researcher is that Virginia employers were contacted directly. However, VCCS workforce development directors, Virginia local and regional economic directors, as well as WIOA directors, are frequently in direct contact with employers; this group was identified as the survey population. VCCS workforce development leaders always partner with local employers to develop and deliver high-demand workforce development training at community colleges. Through the Virginia WCG program, VCCS receives partially subsidized tuition support for each qualifying student who enrolls in an approved workforce development program for high-demand credentials. Virginia has established a list called the New Economy Workforce Industry Credential Grant Program that identifies noncredit, short-term credential-based programs approved for WCG tuition support at each community college (VCCS, 2017a). However, some community colleges cannot offer specific noncredit, short-term credential-based programs due to lack of resources (JLARC, 2017). Thus, more current and comprehensive data are needed to identify employers' demand for industry-recognized credentials offered in a short-term noncredit format in local regions.

This study was limited solely to a group of workforce development stakeholders in Virginia. The sample included local and regional economic developers in Virginia who work directly with employers to recruit new business and industry as well as support existing industry

expansion projects. It included WIOA directors who directly engage with employers and individual workers to financially support the cost of job skill training needs. Additionally, it includes Virginia WIOA directors who provide tuition support for employers and individuals who qualify for tuition assistance. Collectively, all three of the aforementioned groups work together to meet the job skills training needs of local employers; thus, they are experts in the problem under investigation and may be able to offer the information that another researcher might get from employers directly. Another delimitation is the overall scope of this study. Populations from other states were not examined.

Research Assumptions

I assumed VCCS workforce development leaders, Virginia local and regional economic development directors, and Virginia WIOA directors know the specific training needs of employers in their service area and are closely connected to one another on a professional level. They serve businesses and industry daily seeking to meet employers' unique training needs. VCCS workforce leaders also serve as liaisons from their respective community college to the vice chancellor of workforce development and chancellor of the VCCS. Further, I assumed that VCCS workforce development leaders, Virginia local and regional economic development directors, and Virginia WIOA directors network with each other to address employer and employee training needs. Workforce leaders can address employers' needs for employees with certain skilled credentials in specific service local regions typically served by a specific community college.

Definition of Terms

The terms used in this research are defined below. The definitions are derived from a variety of state, federal, and public resources.

Credential

In this study, credential is used to mean noncredit workforce credential, a term defined in the New Economy Workforce Credential Grant Program (2016) as "a competency-based, industry-recognized, portable, and third-party-validated certification or occupational license in a high-demand field" (§ 23.1-627.1).

High-Demand Field

As defined by the New Economy Workforce Credential Grant Program (2016), "high-demand field" means "a discipline or field in where there is a shortage of skilled workers to fill current job vacancies or anticipated job openings" (§ 23.1-627.1).

Industry-Recognized

As defined by the New Economy Workforce Credential Grant Program of 2016, "industry recognized" means "demonstrating competency or proficiency in the technical and occupational skills identified as necessary for performing functions of an occupation based on standards developed or endorsed by employers and industry organizations" (§ 23.1-627.1).

Noncredit Training

Noncredit training refers to short-term training delivered in six months or fewer; it is focused on specific job skills that benefit business and industry (AACC, 2017). Frequently, students who are enrolled in short-term noncredit training at community colleges earn industry recognized credentials instead of official academic college credits (AACC, 2017).

Noncredit Workforce Credential

As identified by the New Economy Workforce Development Grant Program (2016), a "noncredit workforce credential" is "an industry-recognized, third-party validated, portable certifications or occupational license that qualify individuals for employment in high-demand

fields" (§ 23.1-627.1). These workforce training programs offer training that is verified through third-party assessment and is highly demanded by employers (New Economy Workforce Credential Grant Program, 2016).

Stacking Credentials

This term refers to the process of earning several credentials in a related field by using one short-term credential with a labor market value as a foundation for—or step toward—another (Carnevale et al., 2012). Multiple stackable credentials offer individuals increased access to the job market (Carnevale et al., 2012).

Virginia Community College System (VCCS)

This term is the official name of Virginia's community college system, which comprises 23 community colleges (http://www.vccs.edu/).

Workforce Credential Grant (WCG)

Virginia's New Economy Workforce Credential Grant Program provides financial support of up to two thirds the cost of tuition for each qualified student enrolled in an approved VCCS high-demand, noncredit credential training program (New Economy Workforce Credential Grant Program, 2016).

Workforce Development

The VCCS workforce development department can best be described as the division of community colleges that aligns training and economic prosperity to meet the training needs of all business and industry, including new, expanding, or existing companies (Virginia Council on Workforce Development, 2013; See also http://www.vccs.edu/workforce/). Services include assessments, training that leads to state licensure or industry-recognized credentials, customized

training, career coaching, and apprenticeship (Virginia Council on Workforce Development, 2013; See also http://www.vccs.edu/workforce/).

Workforce Development Services

This term refers to the noncredit education and training department of each community college. The role of this workforce development department is to provide short-term training, long-term training, and credential-based programs to both employers and individuals. These targeted training programs help both prospective and incumbent workers to increase their skill levels. In turn, employers and employees become more competitive and can promote economic prosperity for stakeholders (VCCS, 2017b).

Workforce Investment Opportunity Act (WIOA)

This federal law was enacted in 1998 as the Workforce Investment Act (WIA). It provides funding earmarked to provide employment services for employers, workers, and dislocated workers. WIA funds are available as well for qualifying dislocated workers to attend approved training in order to acquire new skills (Workforce Investment Act, 1998). The act was later revised in 2014 as the Workforce Innovation and Opportunity Act and is now referred to as the WIOA. The 2014 revision to WIOA brought strategic coordination of all federal programs related to the skill development of workers (Workforce Innovation and Opportunity Act, 2014). The primary goal of WIOA is to ensure that training programs are coordinated so that both incumbent and prospective workers earn skills and credentials that meet the needs of employers (U.S. Department of Labor, 2017).

Workforce Leaders

Within the VCCS, workforce leaders are employees who serve in the chief workforce development role representing each community college. As shown in Appendix A and Appendix B, there are 23 community colleges in the VCCS system. However, Reynolds Community College and John Tyler Community college have a combined workforce development division. Thus, there are 22 workforce leaders who serve as liaisons to the VCCS Vice Chancellor for Workforce Development at their respective college.

Overview of Chapters

In Chapter I, I presented the introduction, background of the study, statement of the problem, purpose statement and research, significance of the study, overview of the methodology, research limitations, delimitations, research assumptions, definitions of terms, and overview of the chapters. In Chapter II, I reviewed related literature describing high-demand workforce development credentials required by employers. The methodology, problem statement, population and sample, instrumentation, data collection, data analysis, and limitations were outlined in Chapter III. Chapter IV presents the results of the study broken down by each research question and Chapter V provides a discussion of the study's results.

CHAPTER II

LITERATURE REVIEW

In this chapter, I provide an in-depth overview of the literature related to industry-recognized workforce credentials. In the following literature review, I analyze extant literature related to noncredit workforce training offered by community colleges, especially the literature on community college workforce education in the twentieth-century economy, twenty-first century, and various types of industry-recognized credentials. I also review the literature concerning the high demand for health care credentials and the disparity of resources available for community college training among rural and metropolitan areas.

For decades, community colleges have played a major role in local economic development by creating a national asset that offers opportunities for individuals and communities to expand learning and prosper (AACC, 2012). The role of community colleges across the nation has evolved from the focus of helping students earn associate degrees to offering a more comprehensive array of services, including lifelong learning, community services, academic career goals, and workforce development (Nevarez & Wood, 2010). As the function of community colleges has broadened, researchers have studied the increase in the number of credentials expected in various trades (Bowles, 2014; Castellano, Stone, & Springfield, 2005; Carnevale, Smith, & Strohl, 2013; O'Lawrence, 2017). Likewise, researchers have studied employers' increasing demand for employees with industry-recognized credentials (Bowles, 2014; Carnevale et al., 2013; Eisner, 2010). The focus of this research is on identifying the current and future industry-recognized credential needs of employers as understood by Virginia VCCS workforce development leaders, Virginia local and regional economic development directors, and Virginia Workforce Innovative Opportunity Act (WIOA) directors.

Additionally, this research examines the differences between rural and urban demand of credentials and determine if Landon's research conducted in 2009 is still current.

Community College Workforce Education in the Twentieth-Century Economy

Historical Overview

For the last five decades, federal, state, and local governments have improved educational opportunities available at local community colleges by collaborating with stakeholders to develop and deliver training programs, offering literacy training, and expanding noncredit credential training (AACC, 2012). In turn, community colleges have been offering educational opportunities at federal, state, and local levels that have promoted prosperity and economic growth (AACC, 2012). In many localities throughout America, community colleges have become the primary training provider for both credit-bearing career studies certificates and associate degrees as well as short-term noncredit vocational training (AACC, 2012). For community college administrators to improve and expand noncredit training to meet employers' needs, research studies such as this one is critical because community college administrators are in dire need of financial support from external sources to supplement shrinking contributions from state budgets (Jacobs & Dougherty, 2006).

Research related to workforce training was led by Stephen G. Katsinas when he was serving as the director of the Education Policy Center at University of Alabama; the research revealed community colleges are integral to workforce training for adults, especially adults who are low-income earners, welfare recipients, first-generation college students, and students in poverty (Katsinas et al, 2012). Community colleges provide open access to all, regardless of people's socioeconomic level, race, religion, age, gender, or education level (Gilbert & Heller, 2013). Students can access noncredit workforce development training programs even though

they may not hold a high school diploma or General Education Diploma (GED). Even though a GED is not necessarily required, some training programs such as Machining Skills Certification Program at Southside Virginia Community College (SVCC), require students to earn a minimum score on the Work Keys Career Readiness Certificate (CRC) prior to acceptance into the program (SVCC, 2017). The CRC assesses an individual's level of literacy in applied math, workplace documents and graphics literacy (ACT, 2018) prior to acceptance into the program. Access to community college programs enables students to earn postsecondary skills and credentials through workforce development training (Mullin, 2010).

Occupational education did not become an important community college mission until the 1960s when legislators and other stakeholders encouraged community colleges to focus on developing specialized vocational training (Friedel, 2008). Their aim in encouraging community colleges to offer credential-based vocational training was to develop a more skilled, job-ready workforce that would attract new business and industry to both rural and urban areas to stimulate statewide economic development (Friedel, 2008). With local, state and federal funding streams, community colleges are able to serve individuals, employers and individuals by providing non-credit technical training that is accessible and affordable (Lowry & Thomas-Anderson, 2017) In the late 1990s, increased access and expansion of community college noncredit vocational training to serve employers helped to make noncredit workforce development training a national priority (Jacobs & Dougherty, 2006). Advocates of workforce development have identified many benefits to having a workforce with access to industry-recognized credential training, such as employers' ability to be more productive because they can hire workers who possess necessary verifiable credentialed skills, including those related to industrial equipment

maintenance, welding, machining, electricity, and automotive technology (Myran & Ivery,

2013).

Workforce development transitioned from existence in a hopeful, national economic

climate in the 1960s to find their way in a more restorative economic climate in the 1980s. With

declining state economies across the nation in the 1980s, community colleges moved to the

forefront of efforts to stimulate and restore economies through workforce development training

(Zeiss & Paneitz, 2003). In the 1980s, several manufacturers moved their production facilities

overseas to take advantage of lower wage costs (Friedel, 2008). As a result, the national

economy shifted to an information-driven and service-oriented economy. These national trends

negatively impacted the economies of individual states across the country (Friedel, 2008). As a

result of changes in national farm policies and high unemployment in manufacturing industries,

some states were impacted by declines in agricultural farming along with the loss of their

manufacturing base (Katsinas & Lacey, 1989). To retain and attract new business and industry,

states offered employers subsidized vocational training through community colleges in addition

to enticing tax incentives (Friedel, 2008). When states began to subsidize noncredit contract

training, community colleges recognized the benefits of that revenue stream and increased their

efforts to offer customized noncredit contract training for employers (Cohen, Brawer, & Kisker,

2014).

In the late 1990s, community college leaders transformed old-fashioned vocational

programs offered before the 1990s by incorporating employer data (Jacobs & Dougherty, 2006).

Utilizing statewide governmental labor data on the occupational certifications in demand by

employers, community college leaders determined which vocational programs to implement

(Jacobs & Dougherty, 2006). Colleges strengthened collaborations with business and industry,

thereby answering the call to outsource employee training needs and reduce costs (Dougherty & Bakia, 2000). Community colleges have been flexible in designing and delivering customized noncredit training that meets business and industry employers specific training needs. Although community college staff led this change in occupational training, it occurred in workforce development units; operationally, those units were more flexible and accessible than for-credit programs offering more traditional, structured academic instruction (Grubb, Norton, Badway, & Bell, 2003).

By the end of the 1990s, to meet the increasing demand for worker training by business and industry, staffing in some workforce development units increased, and multi-mission centers emerged (Jacobs & Dougherty, 2006). These comprehensive multi-mission centers were frequently developed at an off-campus facility whereby community colleges were not only able to schedule and deliver general education and technical, credit-focused courses but also, they delivered short-term training that awarded industry-recognized credentials. The increased interest in noncredit workforce occupational training helped leaders of community colleges to realize that their localized institutions could be a key provider of training in workforce development while also increasing revenues to fund programs (Roueche & Jones, 2005). This expansion and transformation of community college workforce development divisions not only increased revenues but also strengthened partnerships with state government agencies, schools, and private employers (Amey, Eddy, & Ozaki, 2007). Transformation and expansion of community workforce development units not only helped to increase revenues but also strengthened connections with state government officials and local employer management teams (Jacobs & Dougherty, 2006). Community colleges increased enrollment and built new-found partnerships with employers (Jacobs & Dougherty, 2006). Employers benefited by upgrading

the skills of both incumbent and prospective workers and students achieved employment or promotions (Jacobs & Dougherty, 2006).

However, community colleges' leaders typically move slowly in their response to the development of new training initiatives (Warford & Flynn, 2000). To resolve this issue to meet employers demand to upskill and up-credential the workforce in a timelier manner, the Oxford International Roundtable for Community College Presidents met in July of 2001 to explore solutions. The roundtable resulted in a recommendation that development of new training programs should be developed more expeditiously through each college's workforce development department in order to train a workforce with technical skills and competencies to sustain strong economic development (Forde, 2002).

From 1999 to 2009, community colleges suffered a decline in governmental financial support; during this ten-year period, community colleges did well to maintain spending at the same rate per student whereas universities with more funding support boasted an increase in spending per student ranging from 11% to 31% (Leonhardt, 2013). Due to state and local budget cuts, high dropout rates, and external economic conditions, community colleges have been—and continue to be—challenged to find resources to deliver training programs (Bowles, 2014).

Critique of Community College Workforce Education

Norton and Wilson (2015) have critiqued community college workforce education by arguing that it does not adequately prepare individuals for the workplace. Norton and Wilson (2015) suggested that students enrolled in workforce education programs do not receive sufficient education in higher-level critical thinking skills, which are often taught in liberal arts courses. Community college workforce development divisions prepare individuals for the workforce through vocational programs that offer technical skills training on a short-term,

flexible basis; however, those vocational programs do not, according to Norton and Wilson (2015), emphasize reasoning skills and the ability to solve problems thereby. That gap in the skills training is significant because workers who can think critically and solve problems logically are vital in a globally competitive job market (Norton & Wilson, 2015). Employers need workers with technical skills such as welding and machining; they also prefer workers who can communicate well with coworkers and teams and think critically to solve problems collectively (Norton & Wilson, 2015; R. Stamper, personal communication, Nov. 21, 2014). In 2014, VCCS executives hired a consultant named Dunnigan to identify employability skills, and she found that workers who can communicate creative ideas and solutions to problems are critical in the workplace today (R. Stamper, personal communication, Nov. 21, 2014). Community colleges have been referred to as democracy's college (Diekhoff, 1950). In America's democracy, community colleges should have the same expectation as prestigious universities to prepare students to become active participants in a democratic society instead of merely developing students' technical skills for employment (Norton & Wilson, 2015).

Some critics suggest that performance-based funding such as the New Economy Workforce Credential Grant detrimentally increase production of short-term training programs (Li & Kennedy, 2018). Short term performance-based training programs increase the number of graduates which results in restricted job market benefits (Li & Kennedy, 2018). Public policies that support funding for performance-based short-term training programs ultimately divert students from associate degrees which are known to provide more beneficial economic returns (Li and Kennedy, 2018).

Increased Demand for Skilled Workers

Job skills training and education in America's workforce have lagged behind the increasing demand in the labor market (Holzer, 2012). There is a growing mismatch between declining education levels of the workforce and the advanced skills that will be required for future jobs (Kirsh, Yamamoto, & Sum, 2007). According to the National Center for Education Statistics (2003) National Adult Literacy Survey, by 2030 the projected median level of worker literacy and mathematical competencies will decrease by five percent. If these projections become a reality, as more educated and skilled workers exit employment, they will be replaced by workers with lower educational and skill levels (Kirsh et al, 2007).

According to Kirsh, Yamamoto and Sum (2007), this mismatch is a convergence of the following trends that will create the perfect storm: (a) lower education and skill levels, (b) increased migration of low-skilled Latino workers, (c) increased demand for high skilled workers in manufacturing, and (d) retiring baby boomers. The increasing trend of lower levels of education and incomes has impacted workers' opportunities in the United States (Kirsh et al, 2007). In 2011, the U.S. Census Bureau's American Community Survey reported that 46.2 million people, or 15.0% of the U.S. population, had wages below the poverty level (Bishaw, 2012).

To learn technical skills through industry-recognized credentials, noncredit students need basic literacy and numeracy skills. The Adult Literacy and Life Skills group conducted the National Adult Literacy Survey to determine levels of basic literacy and numeracy (National Center for Education Statistics (1992). Using the results of the survey, the group projected declines in the overall basic literacy and numeracy skill levels of individuals who will be in the workforce by 2030 (National Center for Education Statistics, 1992). The Adult Literacy and Life

Skills group also projected that the number of adults with only basic literacy will rise. The number of adults with the lowest level of literacy and life skills is projected to rise from 17% in 1992 to 27% in 2030 (National Center for Education Statistics, 1992). Using the National Assessment of Adult Literacy (NAAL), the National Center for Education Statistics (2003) determined that half of the adults who scored below basic literacy levels in prose literacy on the assessment had not earned a GED or high school diploma education. Individuals with the highest level of literacy and numeracy (level five) were more likely to enroll in higher education training programs than individuals with the lowest level of literacy and numeracy (level one) (National Center for Education Statistics, 2003).

There is a relationship between an individual's level of skills, earned through postsecondary coursework, and the wages earned. As a person gains more postsecondary education, the person typically gains more skills, and the person's personal income often rises accordingly (Baum, Ma & Payea, 2013). Both American workers and local economies will likely face long-term social and economic consequences if education levels continue to decline and people are mismatched with jobs that require higher-level skills (Kirsh et , 2007). America's future workers need both basic adult education (to gain prerequisite literacy and numeracy) and technical postsecondary education (to gain technical skills that are marketable) (Torraco, 2013).

According to a study published by Castellano et al. (2005), credentials are available in various fields of expertise, and industries use the credentialing process to create confidence that those with certain credentials have mastered certain skills. For example, the information technology industry issues technology credentials through CompTIA such as A+ for technicians who work as computer service techs and Network+ for computer network administrators (Castellano et al., 2005). Other technology credentials include CCNA-Cisco Certified Network

Associate issued by Cisco and Microsoft Office User Specialist issued by MOUS (Castellano et al., 2005). In the manufacturing industry, the American Welding Society (AWS) offers credential assessments to verify various skill levels in welding (American Welding Society, 2017). In order to become credentialed, workers must undergo testing based on techniques used in varied welding industries (American Welding Society, 2017). Additional on-the-job experience and formal training are also necessary to acquire advanced welding credentials (American Welding Society, 2017).

Community College Skills Training

In 2010, community colleges enrolled more than 13 million students in both noncredit and credit courses (AACC, 2012). During that time of economic recovery, community colleges were a primary resource for upgrading workers' credentials (AACC, 2012; Jacobs, 2011). Community colleges have been instrumental in retraining the American workforce and developing new industries (AACC, 2012; Jacobs, 2011). Colleges that offer noncredit workforce development training provide important opportunities for job seekers, especially individuals who might not otherwise attend college-level training (Ozmun, 2012).

There is a powerful connection between an individual's education and the ability to escape poverty through upward mobility (Holzer, 2015). Myran & Ivery (2013) have conducted a literature review related to how community colleges provide educational opportunities for students from diverse populations, thereby empowering them economically and socially. Traditionally, workforce development leaders have understood that the more educated workers are, the more likely they will be gainfully employed, contribute to their community, earn decent wages, purchase a home, and raise a family (Kruass, 2017). The results of the Myran and Ivery literature review revealed that a large proportion of racial and ethnic minorities were not

adequately prepared with the necessary industry-specific skills needed to enter the workforce (Myran & Ivery, 2013). Krauss (2017) asserts that people from racial and ethnic minority populations could enter the job market by first enrolling in competency-based community college programs in which they both mastered industry-specific skills or middle skills and earned nationally-recognized certificates or credentials. With those certificates or credentials, people from racial and ethnic minority groups could obtain solid jobs that often pay between $35,000 and $75,000 annually (Myran & Ivery, 2013). That education and credentialing through competency-based programs, Krauss (2017) suggested, might help close the gap between poverty and wealth.

Community colleges across the country are implementing strategic initiatives to remove barriers to better serve underrepresented students who are interested in work ready training programs (Bumphuss, 2017). Some community colleges are implementing summer developmental programs and educational communities; some are offering student support, employer networking initiatives, and stackable courses and programs (AACC, 2014). President Barack Obama brought community colleges to the forefront of education policy by hosting a first-ever community college summit at the White House (The White House summit on community colleges, 2011). Additionally, he requested that community college leaders produce an additional five million community college graduates by the year 2020 (The White House summit on community colleges, 2011). That request was motivated by data suggesting that two in three job vacancies now require some level of postsecondary education, and 40% of U.S. college students enrolled in college choose to attend community colleges (Obama, 2015).

Training programs offered to students at community colleges are designed to meet the job skills needed by local employers (AACC, 2014). Bowles (2017) spoke with Dr. Angeline

Godwin, who was serving as president of Patrick Henry Community College, and she indicated that employers seek tangible skills offered through community colleges so their workers will be adequately skilled to earn a living wage and support their families.

To sustain high-quality career training programs, community colleges must provide both credit and noncredit training. Some certificate programs can take a year to complete because they comprise stackable credentials in which one short-term credential is sought after another (one qualifies or prepares the participant for the next) and can be customized for the unique workforce needs of a specific industry (Myran & Ivery, 2013). Individuals pursuing this career path earn one high-demand industry-recognized credential after another in a clear and meaningful sequence such that each program builds on the foundation established by the preceding program(s) (Jenkins, 2006). The training programs are aligned with employers' needs (Jenkins, 2006), so individuals who earn stackable industry-recognized credentials increase their employability (Killingsworth & Grosskopf, 2013; Scully-Russ, 2013). Earning industry-recognized credentials can also be beneficial for workers who wish to continue their education by earning college credits (Carnevale et al., 2012; Jenkins, 2006). Individuals can apply the credentials they earned through stacking credentials toward college credits that can be applied toward a college degree or certificate (Carnevale et al., 2012; Jenkins, 2006).

Importance of Data

State and local labor market data are needed to assist community college leaders in making decisions centered around career training programs (Lebesch, 2012). Data on unemployment rates, demand for specific job skills, and wages for specific job skills are examples of critical data that help local community colleges determine what specific types of programs are needed (AACC, 2014). For example, by partnering with a research company

called Burning Glass to research local employers' competency and credential needs and the

interests of job-seeking students, Lone Star Community College in Texas developed customized

skills training programs focusing on skills needed in emerging careers in computer technology,

advanced manufacturing, and energy (Woods, 2013). According to Burning Glass, college

administrators are realizing that they must be more proactive in data analytics to help students

acquire employment in specific markets (Woods, 2013). By analyzing jobs posted on the

internet in local areas, Burning Glass was able to determine the types of jobs with active

recruitments and what types of certifications, competencies, and years of experience were

required to meet job specifications (Woods, 2013). With these types of data from employers,

community college administrators can make better informed decisions about the types of training

programs to develop to close the gap between the competencies and certifications needed by

employers and those held by prospective employees (AACC, 2014).

In this section, I have reviewed research that has demonstrated that college leaders need

current metrics as they make decisions related to curriculum and workforce development.

Current data related to employers' essential needs for high-demand, industry-recognized

credentials are extremely beneficial for stakeholders in economic development, higher education,

WIOA administration, business, and industry; such data may help them in their decision-making

processes and strategic planning (AACC, 2014). In the next section, I review the demand for

high-skill credentials and how community colleges play a vital role in meeting the training needs

of local employers to up-skill and up-credential prospective and incumbent workers with high-

demand, industry-recognized credentials.

High-Demand Occupational Skill Needs

Workforce development offers an opportunity for policy makers and educators throughout the United States to improve workforce skills and industry-recognized credentials that employers seek as evidence of such skills, particularly during economically recessed or depressed periods (Scully-Russ, 2011). Unemployment and underemployment reached high levels as a result of the recession that began in 2007 (Scully-Russ, 2011). In the years leading up to the recession, total job growth had declined slightly by 0.5% (Scully-Russ, 2011). The early years of the twenty-first century will be challenging for community colleges and other stakeholders who are seeking to meet employers' needs now and in the future by addressing the lack of workers with technical skills and measurable competencies (Forde, 2002). According to research conducted in 2012 by the Bureau of Labor Statistics (BLS) Occupational Employment Statistics, the number of jobs requiring some level of postsecondary education may increase by 14% by the year 2022 (Richards & Terkanian, 2013). Some state officials have stated publicly that there is nothing more important for creating jobs than fostering a smart, well-trained workforce (McAuliffe, 2014). To that end, some cumbersome, confusing, and inefficient workforce development systems need to be streamlined so that the system meets employers' needs (McAuliffe, 2014). Workforce development stakeholders in Nebraska, for instance, collaborated with employers who required high-demand skills training by developing online, interactive training modules that are available to employers' entry-level and advanced workers 24 hours a day, 7 days a week (Pauley, 2001). Stakeholders in Virginia have collaborated and streamlined efforts to create training and employment opportunities for veterans; their goals are to help more veterans attain industry-recognized credentials and gain employment soon after leaving the military (McAuliffe, 2014). Stakeholders believe that retraining veterans and helping

them to find employment will create a critical economic advantage for Virginia. During his speech to the Virginia Joint Assembly, Governor Terry McAuliffe stated, "Giving them the tools they need to thrive in the civilian workforce will give Virginia a critical economic advantage as we compete with other states and other nations" (McAuliffe, 2014).

The need for economic growth and development has been recognized elsewhere in the United States not only by policymakers but also by employers who complain of a skills gap (McAuliffe, 2014). Governor McAuliffe (2014) stated it is critical that "we listen to what employers want and build a system that meets their needs". The skills gap in America is real; the National Federation of Independent Business determined that during the first quarter of 2017, 45% of small businesses could not find applicants with the required skill set to fill job vacancies (Kaplan, 2017). There are shortages of workers for middle-class occupations, such as construction trades, automotive technicians, heavy equipment operators, computer support specialists, truck drivers, and nurses (Kaplan, 2017). If these jobs are not filled in a timely manner, business production will be slower; thus, local economic growth will also be slower (Kaplan, 2017).

Employers look to community colleges to help close the skills gap (National Skills Coalition, 2016). Community colleges can determine which specific technical skills are needed locally and target training programs that meet those high-demand needs (Woods, 2014). The technical skills earned through verifiable third-party credentialing systems are at the core of what employers' demand. It is vital for administrators in higher education to see where credentialed students will be employed and identify credentials required for relevant jobs, so students have a competitive edge (Murray & Ullman, 2011). The most successful workforce training programs improve their programs based on information employers share with them (AACC, 2014).

Community colleges can determine workforce training needs by turning to labor market data analysts such as Josh Wright, the senior editor at Economic Modeling Specialists International (ESMI) of Moscow, Idaho, for strategic labor market information (Woods, 2013). Woods (2013a) spoke about Mona Rabon of Central Piedmont Community College (CPCC), and her perspective on how the needs of local employers motivate schools to establish and continue training programs. Community colleges that train workers in high-demand, cutting-edge fields will help their state and local government to gain jobs required for the twenty-first century economy (Forde, 2002).

Most high paying jobs require some education and training beyond the high school level (AACC, 2012). The popular push for students to earn a four-year degree often overshadows promising opportunities for high paying jobs in credentialed workforce development fields (Carnevale, Smith, & Strohl, 2014). According to the Center on Education and Workforce (2013), Americans can earn lucrative salaries by choosing career and technical education over the prospect of enduring years of a high-cost formal education degree (Carnevale et al., 2014). The center's research showed that 43% of workers with certificates and licenses earn more than workers with an associate degree (Carnevale et al., 2014). Further, 27% of young workers with certifications and licenses earn more than workers with a bachelor's degree (Carnevale et al., 2014).

The AACC (2012) has encouraged community colleges to establish computerized tools that would grant local colleges access to workforce market data; colleges and stakeholders could thereby track and identify credential and skill gaps in their service areas. According to the National Skill Standards Board (NSSB), standardized curriculum and workforce credentials that are based on industry skills are an excellent workforce tool for workers in local communities

(Castellano, Stone, & Stringfield, 2005). Verified job skill credentials prove that individual workers have portable skills that are recognized across the United States (Spill, 2002). According to Spill (2002), for communities across the United States, a highly trained and credentialed workforce will most likely attract new business and industry seeking to retrain and employ workers with portable skills. Therefore, an industry-recognized credential is a powerful tool for economic development (Castellano et al., 2005).

Workforce development training can benefit individuals and the broader US economy. For individuals, training builds their opportunity to move up the skills ladder and enhances their capacity to become a worker with higher wages (National Skills Coalition, 2016). In several career areas, such as manufacturing, gaining industry-recognized credentials can help individuals increase job skills and obtain employment (Wilson, 2016). Most manufacturing jobs offer higher pay and benefits than other industries (Katsinas et al., 2012). The National Association of Manufacturers (NAM) is focusing on expanding the number of workers with industry-recognized credentials (Katsinas et al., 2012). NAM and the Manufacturing Institute collaborate with other industry credentialing authorities to promote efficiency in the industry and economic prosperity in the United States (http://www.themanufacturinginstitute.org/). Workers personally improve their individual employability and technical skill level by earning industry-recognized credentials (Katsinas et al., 2012). Prospective workers and incumbent workers who earn industry-recognized credentials make themselves more employable. Through gainful employment, an individual can add value to their local economy (O'Lawrence, 2017).

According to O'Lawrence (2017), when individual workers can use skills they acquired through workforce development training to gain high-wage employment, they can become productive members of their local community's economy. In terms of the economy, a workforce

that is highly skilled and trained contributes to a vital economy, and community colleges can help produce that economic asset (National Skills Coalition, 2016). Established economies seek to attract new business and industry (O'Lawrence, 2017). Maintaining the productivity and skills of domestic workers and skills training are essential to that aim (National Skills Coalition, 2016). Employers are now less interested in employees with specific college degrees and more interested in finding employees with specific skills and credentials, business acumen, technical literacy, innovative thinking, an initiative for learning, and leadership (O'Lawrence, 2017). Job seekers with specific industry-recognized credential training will have an excellent pathway for students to acquire high paying jobs and become marketable across multiple industries (AACC, 2014). Examples include the National Institute for Metalworking Skills (NIMS), AWS, and Manufacturing Skills Standards Council (MSSC) provides an excellent pathway for students to acquire high paying jobs and become marketable across multiple industries.

Nursing and allied health care professionals.

By 2020, the health care industry anticipates hiring 3.5 million professionals (Carnevale & Smith, 2013). Due to an increasingly aging population and a shift from inpatient to both outpatient care and homecare services, there is a high demand for health care professionals (Carnevale & Smith, 2013). According to BLS data (2017), employment growth for jobs that require a registered nurse credential is projected to grow by 16% for the decade between 2016 and 2026. As a testament to that projection, growth for registered nurse jobs is much more accelerated than the mean of all jobs (BLS, 2017). For several years, America has dealt with a shortage of credentialed nurses (Grant, 2016). With an increasingly aging population, the nursing shortage crisis is projected to get worse (Grant, 2016). An increasingly aging population is not the only factor; other factors impacting the nursing shortage are an increase in

chronic disease, lack of educational institutions with capacity to deliver quality health care training, and a retiring workforce of nurses (Grant, 2016).

Demand for nursing credentials. Based on recent employment trends, there is a shortage of health care workers in America (Murray & Ullman, 2011). Hospitals, nursing homes, and other medical facilities increasingly have a higher demand for licensed nurses (Murray & Ullman, 2011). Murray and Ullman (2011) spoke about Rebecca Harris-Smith, Director of Delgado Community College's (DCC) Practical Nursing Center of Excellence, and how she described there has been a resurgence in the demand for licensed practical nurses. According to Harris-Smith, most nursing students can get job offers before they even graduate (Murray & Ullman., 2011). Licensed nurses are not the only health care professionals in demand; allied health care professionals are also needed (Osterland, 2016). As projected by the BLS (2016), health care and fields related to health care will be the highest section of employment in American's economy by 2024 (Osterland, 2016). By 2024, as many as 458,000 new positions will be created for aides in personal care, and 348,000 new positions will be created for aides in home health (Osterland, 2016).

Since health care workers are in such high demand, community colleges are coming together with stakeholders to meet the demand for licensed nurses as well as allied health workers (Woods, 2013). Community colleges across America are critical training providers that offer comprehensive training for credentialed health care workers (Woods, 2013). As an example, President David Sam of Elgin Community College (ECC) in Chicago, Illinois, worked with local stakeholders to build a 41-million-dollar Health and Life Science building to better position ECC to meet the demand for trained health care workers (Elgin Community College, 2016). This state-of-the-art facility features ample space: 29 classrooms and well-equipped

training labs, which enable ECC to train students in 12 different credentialed health care careers (Elgin Community College, 2016). In Largo, Maryland, Prince George Community College (PGCC) opened a 43-million-dollar Center for Health Studies (Clark, 2012). This center was built using local and state taxpayer funds to meet the local demand for trained health care workers (Woods, 2013). This technical facility offers simulation labs, high tech classrooms, computer labs, and administrative offices (Woods, 2013). With this new facility, PGCC can accommodate over 1,000 students in ten health care programs, which include nuclear medicine, optometry assistant, physician assistant, surgical technology, diagnostic medical sonography, nursing, and respiratory therapy (Clark, 2012).

According to Teri Morisi, a branch chief at the BLS, most of the rapid growth positions are in health care or positions involved in health care (Osterland, 2016). Morisi further stated that as the baby boomer generation ages, there will be an increased demand for health care services in 2024 (Osterland, 2016). According to the Association of Schools of Allied Health Professions (ASAHP) (2015), allied health care professionals are defined as "involved with the delivery of health or related services pertaining to the identification, evaluation, and prevention of diseases and disorders; dietary and nutrition services, rehabilitation and health systems management, among others" (p. 1). Further, allied health care professionals are described as health care practitioners who have been formally trained through classes and clinical training and hold industry-recognized credentials, registration, and/or licensure (Association of Schools of Allied Health Professions, 2015). These include technicians, technologists, and other professionals who support health care delivery in a variety of facilities (Association of Schools of Allied Health Professions, 2015). Despite proven successful career paths available through credential-focused

workforce education, many parents and students are not aware of these promising career opportunities (Etzwiler, 2017).

Manufacturing

In careers such as manufacturing, students who earn a series of credentials not only increase their skill level but also increase their chances of initial employment (Manufacturing Institute, 2010). At the peak of the recent recession, manufacturers could not fill 32% of their jobs because the workforce did not have the skills demanded by employers (Manufacturing Institute, 2010). Manufacturing skills verified through third-party credentials such as AWS and NIMS are in high demand; thus, manufacturing industries pay higher wages and benefits to employees as compared to other industries (Katsinas et al., 2012). According to NAM's 2014 report, the average U.S. manufacturing worker in 2016 earned $82,023 including benefits per year as compared to the average nonfarm industry worker who earned $64,609 with benefits (Crain & Crain, 2014).

A major policy objective of the National Association of Manufacturers has been to expand the number of adults with credentials recognized by industry (National Association of Manufacturers, 2017). The Manufacturing Institute projects that by 2027 about 3.5 million jobs in manufacturing industries will need to be replaced (National Association of Manufacturers, 2017). Over the decade 2017 to 2027, as many as 2 million manufacturing jobs will not be filled due to the skills gap (National Association of Manufacturers, 2017). Community colleges have been instrumental in helping to fill these skill gaps; however, there is still work to be done (National Association of Manufacturers, 2017).

Credentialing agencies. MSSC is an industry-based, testing, training, and certification (i.e., credentialing) authority that targets core skills and expertise needed by the nation's

production and supply-handling workers (Manufacturing Skills Standards Council, 2017). The

national MSSC System standardizes specific industry procedures and processes to offer

incumbent and new workers the opportunity to prove they possess the skills needed for twenty-

first century technological careers (Manufacturing Skills Standards Council, 2017). MSSC

offers the following certifications: Certified Production Technician and Certified Logistics

Technician (Manufacturing Skills Standards Council, 2017).

Another well-known credentialing agency is the National Institute for Metalworking

Skills (NIMS); NIMS is a metalworking skills credentialing authority that certifies national skills

standards for metalworkers and machinist (National Institute for Metalworking Skills, 2017).

NIMS assesses individuals on theory as well as performance standards (National Institute for

Metalworking Skills, 2017). The NIMS performance standards are designed and approved by

industry experts (National Institute for Metalworking Skills, 2017). Machinists and other

workers with CNC machining skills verified through the NIMS credentialing system are in high

demand by employers; thus, educators use the NIMS curriculum and third-party assessment tools

to help students and workers acquire these measurable skills and credentials (National Institute

for Metalworking Skills, 2017). Based on the 2017 BLS national average salary data, machinists

earn $86,440 in the natural gas distribution industry sector and $46,330 in the engine, turbine,

power transmission and equipment manufacturing industry sector (BLS, 2017). Employers use

the nationally-recognized credentials in their recruiting, hiring, and promotion of human

resources because they are proof that prospective candidates have verifiable jobs skills needed

for effective business operations (National Institute for Metalworking Skills, 2017).

Although NIMS recognizes credentials in metalworking skills, the American Welding

Society (AWS) uses welding standards as a guideline to certify individuals in various areas of

welding (American Welding Society, 2017). Credentials awarded by AWS include Certified

Welder and Certified Welding Fabricator. These standards are developed from a group of subject

matter experts in the welding field (American Welding Society, 2017). The American National

Standards Institute (ANSI) is the leading authority that approves AWS standards. As a result,

AWS must follow stringent rules and expectations that govern the development of welding

standards (American Welding Society, 2017). According to the 2017 BLS data, welders in the

electric power generation, transmission, and distribution industry sector earn an average salary of

$76.600 per year and welders in the ship and boat building industry sector earn an average salary

of $48,730 (BLS, 2017).

Computer Support Specialist. Manufacturing is not the only field in which workers

with credentials are in high demand; advances in computer technology have fostered high

demand for computer support specialists needed to resolve technical software and hardware

issues with computers (BLS, 2016). Demand for computer support specialists is expected to

increase by 11% from 2016 to 2026 (BLS, 2016). Computer technology specialists earned an

annual median wage of $52,160 in 2016 with professional certifications (BLS, 2016).

Virginia Workforce Development Initiatives.

To meet the demand for industry- recognized credentials, Governor McAuliffe of

Virginia established a new economy workforce initiative by implementing Executive Order No.

23 (2014). This executive order declared that a new workforce agenda is required "to fill jobs of

today and the future" (Executive Order No. 23, 2014, p. 63). These jobs will require

postsecondary education or workforce credentials in such areas as science, technical trades, and

health care (Executive Order No. 23, 2014). The Commonwealth of Virginia estimates that

500,000 new jobs will be created in Virginia by 2022 (Executive Order No. 23, 2014). Extant

jobs will also be available for people entering the workforce or changing employment because a retiring workforce of approximately 903,000 will need to be replaced (Executive Order No. 23, 2014).

In 2016, Virginia's General Assembly funded House Bill 66, which established the New Economy Workforce Credential Grant Fund and Program that partially funds tuition of VCCS students enrolled in approved noncredit workforce development training programs (New Economy Workforce Credential Grant Program, 2016). VCCS students who are deemed as domiciled in Virginia and are enrolled in an approved workforce training program that leads to completion of nationally-recognized, high-demand credential(s) may be eligible for two-thirds tuition support (Office of the Governor of Virginia, 2016). The financial support provided by the New Economy Workforce Credential Grant Fund was implemented to help the Commonwealth of Virginia meet the goal of Executive Order 23 (Office of the Governor of Virginia, 2016). This publicly funded performance initiative in Virginia is the first of its kind in the United States (Office of the Governor of Virginia, 2016). This initiative will help establish and maintain a supply of credentialed workers, people who hold industry-recognized credentials that demonstrate that they possess skills that Virginia employers desire (Office of the Governor of Virginia, 2016). When Virginia's Executive Order No. 23 (2014) was announced, Governor McAuliffe proudly stated, "This week's launch is the culmination of many months of hard work by public and private sector partners, all of us working together to ensure that Virginia has a twenty-first century workforce with the skills and experience to compete in today's global economy" (Office of the Governor of Virginia, 2016).

Summary

In summary, this chapter discussed extant literature related to community colleges and noncredit training and how researchers have studied the increased demand for industry-recognized credentials. Noncredit customized training offered by community colleges has advanced from general customized training to more holistic and collaborative training which includes industry-recognized credentials needed by employers in employees. Due to an increased demand by employers for skilled workers who have earned nationally recognized credentials, community colleges' administrators have been diligent in implementing flexible noncredit, short-term credential-based training to meet the needs of business and industry. As such, community colleges have been instrumental in upskilling and up-credentialing workers to improve economic development. Community colleges use detailed reports and local data to develop specific workforce development training programs that include industry-recognized credentials that meet employers' needs (Woods, 2014). Community colleges face challenges in meeting the credential training needs of employers due to lack of resources. This research provides additional data for workforce development stakeholders to identify the credentials needed in rural and urban areas. In particular, it will assess the degree to which health care maintains its lead in credential demand over other professions, as previous research indicated it held in the past. Chapter III will provide detailed information about the descriptive methodology, survey instrument, data collection, and data analysis.

CHAPTER III

METHODOLOGY

In this chapter, I describe the methods and procedures that I used to investigate my target population's perceptions of the current industry-recognized workforce credentials in high demand by employers. Individuals in my target population commonly network among themselves and collaborate to meet employers' workforce skill training needs (Virginia Board of Workforce Development, 2017). As directed by the Business Services Requirements policy established by the Virginia Board for Workforce Development (2017), local regions are expected to establish formal business services teams to foster collaboration between workforce development stakeholders. I selected the 151 individuals of my target population to be surveyed because they not only meet workforce skill needs of employers through their respective positions (at a community college, economic development office, or WIOA office) but also collaborate among themselves through local business services teams and advisory groups (Virginia Board of Workforce Development, 2017). In this chapter, I describe my survey methodology.

Problem Statement

Landon (2009) conducted a research study that focused on issues and emerging trends affecting workforce development in Virginia. My work is an extension of Landon's 2009 work. Recently, D'Amico et al. (2017) determined that there has been little research on the demand for noncredit workforce development enrollment in community colleges. The problem I targeted was to extend Landon's research by identifying current and future industry-recognized credentials in high-demand by employers operating in rural and urban areas in Virginia. By surveying VCCS workforce leaders, Virginia local and regional economic development

directors, and Virginia WIOA directors in Virginia, I identified current and future industry-recognized workforce credentials that are in high demand by employers.

My purpose was to identify current and future industry-recognized workforce credentials in high demand by employers as identified by VCCS workforce leaders, Virginia local and regional economic directors, and Virginia WIOA directors. My literature search indicated only limited recent available research concerning the workforce industry-recognized credential needs of employers in Virginia, and I concluded from this that there was a need for new research to identify the current and future credentials in demand by business and industry. My findings will provide valuable information for the survey population as well as other workforce development stakeholders. Such data will enable workforce development stakeholders in Virginia to collaborate in seeking financial support from internal and external resources for the development and provision of needed training resources.

Research Questions

1. What industry-recognized workforce credentials are currently in high demand by Virginia employers, and what industry-recognized workforce credentials are likely to be in high demand in the future?

    a. Are workforce credentials in the field of health care currently being demanded most by Virginia employers, and will they likely be demanded most in the future?

2. What industry-recognized credentials are currently in demand of employers based on stakeholder type?

3. How do current and future demand for industry-recognized workforce credentials compare amongst rural and urban regions of Virginia?

Research Design

I designed my survey (Appendix C) to identify participants' views on the current and future industry-recognized credentials needed by employers in Virginia. After I received IRB approval, I distributed an online survey to answer my research questions. My survey instrument addressed my purpose and the research questions by asking respondents to identify workplace credentials that employers require workers to have (Creswell, 2009; Rea & Parker, 2005). I did not formulate a hypothesis about what I expected to find (Plano Clark & Creswell, 2010, Creswell, 2009; Hays & Singh, 2012), but instead simply obtained the views and opinions of stakeholders (Creswell, 2009; Hays & Singh, 2012) representative of the state of Virginia.

Survey research is a recommended method for data collection when targeting a large geographical area such as Virginia (Creswell, 2003; Yun & Trumbo, 2000). Surveys are one of the major types of instruments used in research (Calder, 1998). Surveys can assist researchers in collecting data about specific topics (Lebesch, 2012), such as industry-recognized workforce credentials needed by employers. Electronic or online surveys have grown in popularity because they are easy for stakeholders to use, easy to develop, and offer rapidly available results (Yun & Trumbo, 2000). Electronic web-based surveys have advantages with respect to cost and the speed of implementation as well as ease of follow-up (Dillman, Smyth & Christian, 2014; Rea & Parker, 2005). An electronic survey was an appropriate means by which to collect participant responses in this study because the selected population was distributed across the entire state of Virginia. Since the survey population included workforce professionals who were currently employed, I assumed that each participant had access to the internet as well as a reasonable comfort level when using the internet.

One limitation of online surveys is that targeted participants, for various reasons, may elect not to fully complete the survey; however, the evidence indicates that respondents can provide superior responses to open-ended questions compared to traditional pen and paper surveys (Dillman et al., 2014). To increase response rates, I kept the number of open-ended questions to a minimum.

Population and Sample

My target population included workforce development stakeholders across the state of Virginia; I selected 151 such stakeholders as my target population, of whom 75 responded (Table 1), including 17 of 22 VCCS workforce development leaders representing each community college's workforce development region within Virginia, 47 of 114 Virginia local and regional economic development directors, and 11 of 15 Virginia WIOA directors.

Table 1

Stakeholder Group Who Participated in Survey (N=75)

Stakeholder Group	Responses (%)
VCCS Workforce development leader (VCCS)	17 (22.7%)
Workforce Innovation Opportunity Act Director (WIOA)	11 (14.7%)
Local County Economic Development Director (Local Ec Dev)	38 (50.7%)
Regional Economic Development Director (Reg Ec Dev)	9 (12.0%)

Demographics

The majority of participants worked in a rural areas (65.3%) with more than 10 years of

experience (61.3%) (Tables 2 and 3).

Table 2

Geographic Region Served by Survey Participants (N=75)

Geographic Region	Responses (%)
Rural area	49 (65.3%)
Urban	10 (13.3%)
Suburban	16 (21.3%)

Table 3
Years of Experience of Respondents (N=75)

Years of Experience	Responses (%)
No response	3 (4.0%)
< 1 year	3 (4.0%)
1 – 5 years	11 (14.7%)
6 – 10 years	12 (16.0%)
>10 years	46 (61.3%)

Instrumentation

Instrument Design

I designed the survey instrument to collect data on current and future workforce

credentials in demand by employers with attention to health care credentials and how credential

needs compare between rural and urban regions. The 12-item survey instrument included three

demographic questions, five closed-ended Likert scaled and four open-ended questions.

Structured, open-ended questions give researchers some control over the line of questioning

(Dillman, Smyth, & Christian, 2014); give substance, depth, and consistency (Dillman, 2000) to

the Likert-scaled survey questions; and give the researcher an "opportunity to learn the

unexpected" (Fowler, 1995, p. 59). Open-ended questions give respondents an opportunity to

clarify their answers or provide greater detail to support their respective opinions. Open-ended

questions are designed to ask respondents to describe experiences; they give respondents the

opportunity to ascertain a process, describe experiences or seek discovery about a particular

subject matter (Hays & Singh, 2012).   I considered my open-ended questions essential because

respondents were not only asked about current credential needs, they were also asked to predict

what credentials will be in high demand in the future.

Piloting the Instrument

Prior to distribution of the final survey instrument, the draft survey was carefully

reviewed by a group of subject-matter experts. The group comprised 10 workforce development

experts, who were asked to complete the survey rating form (Appendix D). The rating form

includes the following five questions:

1. Does the survey fulfill the data collection needs of the study as defined in the statement
   of the problem and the research goals?

2. Were the directions for completing the overall survey clear?

3. Was the layout of the survey easy to read?

4. Were the statements clear?

5. Were there any grammatical or spelling errors?

The group of experts was selected from members of the National Council on Continuing Education and Training (NCCET), members of the AACC (AACC), VCCS workforce development employees, and Virginia WIOA employees. The experts were excluded from participating in the actual research study. The workforce development experts reviewed the proposed survey instrument to ensure the survey instrument had face and content validity. The proposed survey instrument was revised based on feedback from the panel of experts.

Once I obtained approval from my dissertation committee, I applied to Old Dominion University's Institution Review Board (IRB) for approval of exempt status. Approval from both my dissertation committee and Old Dominion University's IRB was required before the research survey could be officially distributed. A copy of my IRB approval letter and informed consent form is included in Appendix E and F.

Survey Distribution

The validated survey instrument was distributed electronically via Survey Monkey. I chose to distribute the survey link via electronic mail due to the ease of reaching workforce development professionals employed by various agencies across a large geographic area. Further, electronic collection of responses eliminates time-consuming transcription and provides an accurate written record of participant responses (Creswell, 2009).

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Data Collection

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In this section I provide an overview of data collection. First, I present detailed data of steps taken to collect stakeholder contact information prior to officially collecting data. I present specifics on how data were collected through a combined quantitative and qualitative survey instrument distributed through electronic emails.

Procedures Prior to Data Collection

My first step was to locate specific contact information for each member of the

stakeholder group. I requested the most current list of contact information for the VCCS

workforce leaders for each Virginia community college from the VCCS systems office --

referred to as the VCCS Workforce Development Advisory Council. I then collected

preliminary contact information for the directors of Virginia's 15 WIOA regions from the

interactive map on the Elevate Virginia website (http://www.elevatevirginia.org/contact-

us/#local_workforce_areas), which is maintained by the Virginia Council for Workforce

Development. The Elevate Virginia website lists the name of each Virginia WIOA region,

localities served by each region, and the contact information for each regional director. Next, I

collected email addresses of local and regional economic development directors from the

Virginia Economic Developers Association (VEDA) website (https://data.vedp.org/Contacts).

According to the VEDA website, there are 114 local county and regional economic development

directors in Virginia.

Data Collection Procedures

I distributed the survey to a population of 151 stakeholders in Virginia, including 22

VCCS workforce development leaders (abbreviated as *VCCS* below), 15 WIOA directors

(abbreviated as WIOA below), 19 regional economic directors (abbreviated as Reg Ec Dev

below) and 95 local county economic development directors (abbreviated as Local Ec Dev

below).

Introductory letters (Appendix G*)* were mailed to the population to inform survey

participants of the study and the forthcoming electronic survey. The introductory letter included

a brief summary of the value of the research on industry-recognized workforce credentials.

Further, the introductory letter provided information on the purpose of the research, date the electronic survey would be released, security of data, protocol to ensure confidentiality and anonymity, dissemination of results of the survey, and option to reject participation in the survey. To entice interest in participating in the survey (Dillman et al., 2014), a framed $2 bill was included in each introductory letter. The $2 bill was mailed as a novelty token of appreciation for each person's potential willingness to participate in the forthcoming survey. By sending the small monetary incentive, a researcher may create a sense of obligation as identified in the social exchange theory (Blau, 1960; Cosmides, 1989; Emerson, 1976). Dillman et al. (2014) conducted a survey that included a $2 incentive, and that incentive increased their response rates by eight percent.

One week after the introductory letter was mailed via the United States mail service, and the initial email which included a link to the electronic survey was distributed to the target population through a paid electronic data collection service. The email included an informed consent letter which explained the goals of the research and that an aggregated summary of the research findings could be shared upon request. One week after the initial email was distributed, a second reminder email was sent to individuals who had either not completed the survey or only partially completed the survey. Due to computer firewalls, some participants targeted by this survey indicated they had not received the initial email. When this information was discovered, an additional traditional email was sent outside of the customized survey software which included a direct web link to the survey. After each participant completed the survey, an immediate message containing a "thank you note" was displayed. A final email was distributed to the targeted population who had not yet completed the electronic survey notifying participants of the date and time the survey would be closed. This process encompassed a time period of 21

days. This protocol followed the model suggested by Dillman et al (2014). After the survey was closed, the analysis showed that 99 of 151 opened the survey; of these, 24 were removed due to incomplete demographic or survey data, leaving 75 individuals, for a completion rate of 49.7%. Two individuals elected to opt out of the survey.

Human Subjects Training

As required by Old Dominion University, I completed the human subjects training administered by the Collaborative Institutional Training Initiative (CITI) (See Appendix H). A satisfactory passing score is required for the online CITI training. CITI training includes modules on the following topics: students in research, ethical principles, research with human subjects, regulations, assessing risk, informed consent, privacy and confidentiality, and conflicts of interest in research involving human subjects.

Data Management

As data were generated, I stored all data separately on secure primary and backup sources to ensure short-term and long-term security. Electronic data were stored on a device that has security safeguards that include password protection, anti-virus controls, firewall configurations, encryption, individualized identification of approved users, automated operating, and scheduled backups to protect data against theft or loss. All data are scheduled to be erased using hard disk degaussing five years after the research project is completed. Responses were assigned a numeric code to promote confidentiality and protect the identity of individual participants. Responses of participants were kept confidential in a password-protected file.

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Data Analysis

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The survey included both quantitative data collected from Likert-scaled, closed-ended questions and qualitative data from open-ended questions, so I completed both quantitative and

qualitative analyses, with assistance from my co-researcher and auditor, as detailed earlier. I

employed SPSS software to analyze quantitative data and used descriptive statistics to

summarize demographic and professional characteristics, such as rural versus metropolitan areas

and years of experience. Chi-square testing was used to reveal differences in stakeholder

perceptions of credentials needed by employers and differences among rural and urban

geographic areas. Applying chi-square testing, I analyzed the significance between credentials in

demand and each of the dependent variables (urban/rural geographic area, number of years

employed in the workforce field and type of workforce professional). The qualitative data were

coded and categorized into themes to analyze the responses to the open-ended survey questions.

The co-researcher and I used a consistent and well-ordered scheme during coding (Jansen, 2010)

by using a code book to categorize patterns and themes; using a code book is an acceptable

practice when analyzing qualitative research (Hays & Singh, 2012). I developed a code book

prior to compiling data, using the research questions as a guide as I developed codes,

alphabetized them, and then added sub codes (Hays & Singh, 2012). Then I followed the advice

of Tesch (1990) and read and reviewed data, making notations and reviewing responses to

understand the meaning. Next, I grouped the data using the codes and sub codes, and I identified

patterns. As patterns emerged, I revised the coding descriptions and definitions, as needed, and

added new codes. After all data were coded and compiled, I identified themes and patterns by

"chunking" codes (Hays & Singh, 2012, pp. 300-302). "Chunking" of codes is the process of

combining codes into groups or generating themes to determine the relationships among patterns

or codes (Hays & Singh, 2012, p. 300-302). Theoretical constructs related to identifying current

work credentials needed by employers emerged during the process of analyzing the data

(Dillman et al., 2014; Jansen, 2010).

Qualitative research is validated through trustworthiness and credibility, so I strived to accurately reflect the survey participants' messages (Hays & Singh, 2012). In order to support transparency and enhance the trustworthiness of this research, I kept a reflective journal to record thoughts, choices, experiences, feelings, and processes while conducting this research (Mruck & Breuer, 2003). An independent auditor examined the data to protect against the introduction of subjective bias in the analysis and coding of data. The auditor reviewed discrepancies with the me to determine if qualitative responses were placed in the most suitable category. The co-researcher helped me to compare results of the auditor's analysis with the researcher's results to assess the inter-rater reliability. The percentage of time the raters agreed was 100%. This is because the actual researcher defined what codes and themes were to be used and what categories were placed under specific codes. The other rater, or co-researcher, simply assisted with categorizing the data and recorded the coding process. There were no options available and there was an absence of any intrinsic agreement among raters. The raters were in agreement about the exact coding to be used and the data had no order.

Nonresponse Bias

The quantitative findings were analyzed based on a 95% confidence level with a 5 percent margin of error. Based on a population of 151, a sample of 76 participants was needed to reach the targeted response rate of 50%. This study had 75 respondents with a response rate of 49.7%. Since the target response rate of 50% was not met, steps were taken to address nonresponse bias. One method to address nonresponse bias is through weighting or post-stratification. This involves a two-step process which involves first identifying a set of controls that allow the survey data to match. For this study, the researcher used stakeholder type which identified each participant's local area as rural, suburban or urban. Second, post-stratification

requires adjusting the sample totals to the control totals calculating appropriate weights (Fotini,

Evangelia, & Michail, 2013).

I compared the distribution of the stakeholder type in my target population to that of my

sample population; as I found significant differences, I decided to construct sample weights

(following the method described at htttp://www.restore.ac.uk/PEAS/nonresponse.php) by

dividing (target population percent/sample population percent) to adjust for unit non-response.

See Table 4 for results of weighting analysis. The target population percentages are a measure of

how many are in each group in relation to the others. The sample population percentages are

surprising because instead of having fewer individuals in each sample group, two groups were

larger. The stakeholder types VCCS and WIOA increased in percentages. There could be a

number of reasons for this: the stakeholder could see their role differently from their official

classification, and they could believe their role comprises more than one classification. In

addition, the link could have been forwarded to friends, and possible misclassification could

have been made when transcribed. Therefore, to adjust for this, I ran weighted analysis to

compensate at least partly for the nonresponse bias.

Participants were asked to identify high-demand industry-recognized credentials through

open-ended survey questions. As shown in Table 10 and other similar tables, some participants

did not respond to some open-ended questions. My assumption is that some participants found it

tedious and time consuming to identify and rank 20 high-demand credentials.

Table 4

Statistical Weighting to Deal with Nonresponse Bias

Stakeholder Type	Target Population Frequency	Sample Population Frequency	Target Population Percent	Sample Population Percent	Non-response Weight
VCCS	22	17	14.5695	22.6667	0.64277
WIOA	15	11	9.9338	14.6667	0.67730
Local Ec Dev	95	38	62.9139	50.6667	1.24172
Region Ec Dev	19	9	12.5828	12.0000	1.04857

Limitations

The accuracy and validity of a research study can be misguided through misuse of coding and subcoding (Creswell, 2009). I collected data based on active workforce development professionals employed at the time when the survey instrument was deployed. I anticipated that the overall population would total approximately 151 people. The actual sample was 17 VCCS workforce development professionals, 47 Virginia local and regional economic development directors, and 11 Virginia WIOA directors with a response rate of 49.7%. One limitation was that some counties, particularly rural counties, did not have a designated position for economic development. For that scenario, the survey was sent to the county administrator, who possibly had less specific knowledge about economic development than someone in a position dedicated to that area.

Even though the survey questions were structured, many open-ended questions covered divergent topics. The grouping of data into a wide range of categories can lack cohesion and

could have resulted in a disadvantage due to the difficulty of coding a large span of categories, even with the help from the auditor.

Summary

In this chapter, I restated the problem statement and the three research questions designed to identify current and future industry-recognized credentials in high-demand by Virginia's employers. In Chapter IV, the results related to the research questions are presented. I discuss the results of the study in Chapter V.

Chapter IV

RESULTS

In this chapter, I discuss the findings of the study with respect to current and future demand of Virginia employers for industry-recognized workforce credentials based on answers to an electronic survey of key stakeholders who work in workforce development in Virginia.

As mentioned earlier, my research questions were as follows:

1. What industry-recognized workforce credentials are currently in high demand by Virginia employers, and what industry-recognized workforce credentials are likely to be in high demand in the future?

    b. Are workforce credentials in the field of health care currently being demanded most by Virginia employers, and will they likely be demanded most in the future?

2. What industry-recognized credentials are currently in demand of employers based on stakeholder type?

3. How do current and future demand for industry-recognized workforce credentials compare amongst rural and urban regions of Virginia?

As I stated in Chapter III, I conducted weighted analyses to compensate for the possibility of nonresponse bias, thus counts of responses to survey questions will not be integer values.

Credentials Are Important

My survey results leave little doubt that employers value credentials and will continue to do so. About half of the participants considered employees having credentials as very important or extremely important both for the current (52.5%) (Table 5) job market and in the future

(64.7%) (Table 6). As these tables show, only a small fraction of respondents considered

credentials to be not important.

Table 5

Current Importance of Employees to Hold Credentials (Weighted)

Importance level	Response (%)
Extremely Important	14.3 (19.1%)
Very Important	25.1 (33.4%)
Important	16.6 (22.1%)
Somewhat Important	15.3 (20.3%)
Not Important	1.3 (1.8%)
No Response	2.5 (3.3%)

Table 6

Future Importance of Employees to Hold Credentials (Weighted)

Importance level	Responses (%)
Extremely Important	24.4 (32.5%)
Very Important	24.1 (32.2%)
Important	17.0 (22.6%)
Somewhat Important	6.4 (8.6%)
Not Important	0.6 (0.9%)
No Response	2.5 (3.3%)

As I will discuss in more detail in the recommendations section, an obvious consequence of this

finding is that community colleges should continue to emphasize their credential programs,

especially as they make curriculum decisions in the face of tight budgets and a changing higher

education landscape.

Employers Reliance on VCCS Colleges

Just as most respondents affirmed the importance of credentials in the workplace, most of them also affirmed the role of VCCS colleges in providing the training for these credentials. A section of the survey asked about the present and future reliance on VCCS colleges for credentials, as well as about the level of satisfaction with the training provided. A majority (64.2%) of participants believed that employers currently often or almost always rely on VCCS colleges to deliver workforce development training (Table 7).

Table 7 *Reliance of Employers on VCCS for Training (Weighted)*

Reliance level	Response (%)
Almost always	9.9 (13.3%)
Often	38.2 (50.9%)
Sometimes	21.9 (29.2%)
Seldom	2.5 (3.3%)
Never	0 (0.%)
No response	2.5 (3.3%)

Most (89.9%) participants also believed that employers are satisfied, very satisfied, or extremely satisfied with VCCS training (Table 8).

Table 8

How Satisfied were Employers with VCCS Training (Weighted)

Satisfaction level	Response (%)
Extremely satisfied	9.8 (13.1%)
Very satisfied	21.9 (29.2%)
Satisfied	35.7 (47.6%)
Almost satisfied	5.1 (6.8%)
Not satisfied	0 (0.0%)
No response	2.5 (3.3%)

Finally, a majority of participants (78%) indicated their belief that employers would often or almost always continue to rely on the VCCS for their training needs (Table 9).

Table 9

Future Reliance of Employers on VCCS (Weighted)

Reliance level	Response (%)
Almost always	15.3 (20.4%)
Often	43.2 (57.6%)
Sometimes	11.5 (15.4%)
Seldom	2.5 (3.3%)
Never	0 (0.0%)
No response	2.5 (3.3%)

What industry-recognized workforce credentials are currently in high demand by Virginia employers, and what industry-recognized workforce credentials are likely to be in high demand in the future?

I intended the first research question to identify what industry-recognized workforce credentials were in demand by Virginia employers both now and in the future. Survey participants responded to a question which asked them to identify and rank industry-recognized credentials currently needed by employers in their local service area. They ranked health care and social assistance (22%) and manufacturing (22%) as the fields most in need of credentialing (Table 10). Specifically, nursing-related credentials such as certified nurse aide, registered nurse, and licensed practical nurse were most prominent in healthcare, and welding, manufacturing technician, industrial maintenance, and machining credentials were most prominent in manufacturing. Appendices H and I show the detailed raw data of participants' actual responses for each of the current and future top five ranked categories.

Table 10

Current Industry-Recognized Credentials Needed by Employers Ranked #1 Highest

(Grouped, Weighted)

Industry Credentials	Response (%)
Health Care & Social Assistance (HLT)	16.5 (22.0%)
Manufacturing (MNF)	16.5 (22.0%)
No response	14.6 (19.5%)
Transportation & Warehousing (TW)	7.4 (9.9%)
Architecture & Construction (ACO)	6.9 (9.1%)
Information (ITE)	5.9 (7.9%)
Educational Services (ES)	4.8 (6.4%)
Retail Trade (RET)	1.2 (1.7%)
Management of Companies and Enterprises (MGT)	1.2 (1.7%)

Looking to the future, my survey results suggest that employers will continue to value credentials: a majority of stakeholders (64.7%) (Table 6) indicated that in the next five years it will be very important or extremely important for employees to hold industry-recognized workforce credentials. One respondent insisted that VCCS colleges need to "engage with local/regional employers to better assess what the demands on skill will be in 5, 10 and 15 years." Another respondent stated that VCCS colleges should be "constantly staying on the front line of what is needed—not today—but tomorrow. It's not sufficient to keep up with today's trend lines." My first research question sought to identify precisely which industry-recognized credentials are likely to be in high demand in the future, and the survey results are contained in Table 11. Stakeholders ranked manufacturing (20.3%) as the highest in demand in the future by employers, with healthcare and social assistance ranked a close second (20.2%). Appendix I contains the raw data for participants' responses regarding the demand for future credentials.

Table 11

Future Top High Demand Industry Credentials Needed by Employers Ranked Highest
(Grouped, Weighted)

Industry Credentials	Response (%)
No Response	16.6 (22.1%)
Manufacturing (MNF)	15.2 (20.3%)
Health Care & Social Assistance (HLT)	15.2 (20.2%)
Architecture & Construction (ACO)	8.1 (10.8%)
Transportation & Warehousing (TW)	8.0 (10.7%)
Information (ITE)	5.9 (7.9%)
Educational Services (ES)	4.8 (6.4%)
Management of Companies & Enterprises (MGT)	1.2 (1.7%)

According to Landon (2009), health care credentials were highest in demand a decade ago. I wanted to determine if health care credentials remained most in demand by employers and if they will continue to be demanded most in the future. The results of my survey were interesting in this regard: over the past decade manufacturing has caught up to health care. The two fields are tied (22% each) as those in which credentials are currently demanded most (Table 10); likewise, survey participants predicted that credentials in these two fields would remain evenly desired (just over 20% each) in the future (Table 11). This is a significant result of my research, and I will discuss it in the next chapter.

What industry-recognized credentials are currently in demand of employers based on stakeholder type?

I designed my second research question to identify what industry-recognized credentials are currently in demand by employers based on stakeholder type. As described earlier,

"stakeholder type" refers to VCCS workforce development leader, WIOA director, local economic development director or regional economic development director. On closer inspection (Table 12), I found that the VCCS and the WIOA stakeholders ranked health care credentials the most highly (41.2% and 63.4%, respectively), whereas the local and regional development leaders were more tepid in their response (13.2% and 11.1%, respectively). The latter groups tended to emphasize manufacturing as the most highly ranked credential (26.3% and 22.2%, respectively), but VCCS (11.8%) and WIOA (9.1%) stakeholders were considerably less enthusiastic about this choice. These variations between the views of different stakeholders, however, were not statistically significant (χ^2 (24) = 27.1, p=0.299).

Table 12

Current Industry Credential Ranked #1 Highest by Type of Stakeholder (Grouped, weighted)

	Stakeholder Type				
Industry credential	VCCS	WIOA	Local Ec Dev	Reg Ec Dev	Total
	n=10.9(14.5%)	*n*=7.5 (10%)	n=47.2 (62.9%)	n=9.4 (12.5%)	*N*=75 (100%)
Health Care & Social Assistance (HLT)	4.5 (41.2%)	4.7 (63.4%)	6.2 (13.2%)	1.0 (11.1%)	16.5 (22.0%)
Manufacturing (MNF)	1.3 (11.8%)	0.7 (9.1%)	12.4 (26.3%)	2.1 (22.2%)	16.5 (22.0%)
No Response	0.6 (5.9%)	0.7 (9.1%)	11.2 (23.7%)	2.1 (22.2%)	14.6 (19.5%)
Transportation & Warehousing (TW)	3.2 (29.4%)	0.7 (9.1%)	2.5 (5.3%)	1.0 (11.1%)	7.4 (9.9%)
Architecture & Construction (ACO)	0.6 (5.9%)	0 (0.0%)	6.2 (13.2%)	0 (0.0%)	6.9 (9.1%)
Information (ITE)	0.6 (5.9%)	0.7 (9.1%)	2.5 (5.3%)	2.1 (22.2%)	5.9 (7.9%)
Educational Services (ES)	0 (0.0%)	0 (0.0%)	3.7 (7.9%)	1.0 (11.1%)	4.8 (6.4%)
Retail Trade (RET)	0 (0.0%)	0 (0.0%)	1.2 (2.6%)	0 (0.0%)	1.2 (1.6%)
Management of Companies and Enterprises (MGT)	0 (0.0%)	0 (0.0%)	1.2 (2.6%)	0 (0.0%)	1.2 (1.6%)

How do current and future demand for industry-recognized workforce credentials compare amongst rural and urban regions of Virginia?

I intended with my third research question to identify how the stakeholders from different geographic regions of Virginia varied in their perceptions of the current and future demand for

industry-recognized workforce credentials. A majority (65.3%) of the participants served rural

areas, with considerably fewer serving urban areas (13.4%) or suburban areas (21.3%).

Overall, 22.0% of participants indicated health care credentials as the currently highest

ranked credentials needed by employers (Table 13), although this response varied considerably

by region, with suburban participants the least enthusiastic (16.1%), rural stakeholders (20.3%)

only somewhat more so, and urban participants the most enthusiastic (47.6%). Even though

health care (22%) and manufacturing (22%) credentials were equally ranked as currently in high

demand, this trend was slightly different for manufacturing which indicated 15.8% of suburban

stakeholders and 18.8% of urban stakeholders favored this type of credential, compared to 24.3%

of rural participants. Perhaps unsurprisingly, these geographic differences of opinion were also

not statistically significant (χ^2 (16) = 18.5, p=0.293).

Table 13

Current #1 Ranked Industry Credentials Needed by Employers by Geographic Region (Grouped, Weighted)

	Geographic Region			
Industry credential	Rural	Urban	Suburban	Total
	n=52.2 (69.6%)	*n*=7.0(9.3%)	*n*=15.7(20.9%)	*N* = 75 (100%)
Health Care & Social Assistance (HLT)	10.6 (20.3%)	3.4(47.6%)	2.5 (16.1%)	16.5 (22.0%)
Manufacturing (MNF)	12.7 (24.3%)	1.3 (18.8%)	2.5 (15.8%)	16.5 (22.0%)
No response (NR)	11.0 (21.0%)	0 (0.0%)	3.6 (23.0%)	14.6 (19.5%)
Transportation & Warehousing (TW)	6.8 (13.0%)	0 (0.0%)	0.6 (4.1%)	7.4 (9.9 %)
Architecture & Construction (ACO)	3.7 (7.1%)	0 (0.0%)	3.1 (19.9%)	6.9 (9.1 %)
Information (ITE)	1.2 (2.4%)	1.3 (18.8%)	3.3 (21.2%)	5.9 (7.9 %)
Educational Services (ES)	3.7 (7.1%)	1 (14.9%)	0 (0.0%)	4.8 (6.4 %)
Retail Trade (RET)	1.2 (2.4%)	0 (0.0%)	0 (0.0%)	1.2 (1.7%)
Management of Companies & Enterprises (MGT)	1.2 (2.4%)	0 (0.0%)	0 (0.0%)	1.2 (1.7%)

The participants perceived health care and manufacturing as the top credentials needed by employers in the next five years (Table 14). The pattern of responses was very similar to that seen in Table 13; the differences between stakeholders from different geographic regions were not statistically significant (χ^2 (14) =13.7, *p*=0.472).

Table 14

Future Industry Credentials Needed by Employers Ranked #1 by Geographic Region (Grouped, Weighted)

	Geographic Region			
Industry credential	Rural n=52.2 (69.6%)	Urban n=7.0 (9.3%)	Suburban n=15.7 (20.9%)	Total N=75 (100%)
No Response (NR)	11.6 (22.3%)	1.3 (18.8%)	3.6 (23.0%)	16.6 (22.1%)
Manufacturing (MNF)	11.4 (21.9%)	1.3 (18.8%)	2.5 (15.8%)	15.2 (20.3%)
Health Care & Social Assistance (HLT)	10.6 (20.3%)	2.0 (28.9%)	2.5 (16.1%)	15.2 (20.2%)
Architecture & Construction (ACO)	5.0 (9.5%)	0 (0.0%)	3.1 (19.9%)	8.1 (10.8%)
Transportation & Warehousing (TW)	7.4 (14.1%)	0 (0.0%)	0.6 (4.1%)	8.0 (10.7%)
Information Technology (ITE)	1.2 (2.4%)	1.3 (18.8%)	3.3 (21.2%)	5.9 (7.9%)
Educational Services (ES)	3.7 (7.1%)	1.0 (14.9%)	0 (0.0%)	4.8 (6.4%)
Management of Companies and Enterprises (MGT)	1.2 (2.4%)	0 (0.0%)	0 (0.0%)	1.2 (1.7%)

Resources Needed

There were two final open-ended questions in the survey; the first of these concerned resources needed by the VCCS schools to support their programs and the second asked participants how VCCS schools could better serve the credentialing needs of individuals and employers. The participants indicated the specific resources needed by local community colleges to expand existing or develop new programs (Appendix J). The largest number of responses (19.6%) were related to the need for additional funds or cash; one respondent stated that money (actual phrasing: "money, money, money") is needed to improve workforce development

training programs. Participants also described various needs for funding, specifically for

marketing, instructors, outreach to high schools and community partners, expansion of programs,

implementation of new programs, as well as additional resources which would enable greater

flexibility in meeting employers' training needs. The next largest number of responses (14.3%)

related to the need for additional staff support to handle the increased administrative duties

resulting from a higher demand for workforce development training. The respondents (14.3%)

commented that their schools suffered from programming limitations due to the lack of sufficient

classroom space and facilities to meet the local demand for workforce development training.

Respondents (12.5%) also felt that their school lacked equipment necessary to provide needed

credential training. One respondent noted the need for equipment to offer dental assistant

training, physical therapy assistant training, and occupation therapy assistant training programs.

Without proper state of the art equipment, local community colleges cannot develop and

implement proper workforce development programs. Thus, employers' access to workers with

high demand credentials is directly impacted.

VCCS Can Better Serve

The second open-ended question elicited responses concerning specific ways that VCCS

colleges can better serve individuals and employers with the end result being the development of

a highly skilled and credentialed workforce (Appendix K). The largest number (26.8%) of

responding participants noted that VCCS colleges needed to involve local business leaders in the

development of the curriculum, collaborate on outreach to employers, listen to employers, and

build stronger relationships with employers. Slightly fewer (23.9%) responded with comments

identifying the need to market credentials using salary data, increase state agency requirements

for credentialed workers, make workforce development an equal component of the community

college mission, adopt the National Career Readiness Certificate (NCRC), be more adaptable to meet demands of employers, and build better career pathways with local high schools.

Summary

Overall, credentials in health care and manufacturing are equally in high demand by employers currently and in the future. These rankings varied somewhat according to stakeholder group. Likewise, comparisons among rural and urban/suburban participants revealed differing perceptions of which industry credentials were in greatest demand by employers. Overall, these variations in stakeholder and regional perspectives were not statistically significant. In Chapter V, I provide a discussion of my results concerning which industry recognized workforce credentials are needed by employers in Virginia. I also discuss my recommendations for future research.

CHAPTER V

DISCUSSION

Community colleges across the United States have state supported systems that offer noncredit short-term vocational training programs thereby providing the opportunity for students to obtain industry recognized credentials (Myran & Ivery, 2013). These verified workforce credentials help to improve incumbent and prospective workers' qualifications in order to meet the demand of employers.

Problem statement

Through this study, I sought to identify current and future industry-recognized workforce credentials in demand by employers in Virginia. My results may help workforce development stakeholders seek additional internal and external financial support to implement new credential-based workforce development training programs or expand existing programs. My findings may also help in the development of strategic plans to meet employers' workforce needs.

Only credential-based training programs that have been formally approved by a VCCS administration can be offered with support of the state's noncredit pay for performance program (8 Va. Admin. Code § 40-160, 2017). If individual colleges lack the proper resources needed to offer a specific workforce development credential-based program, they will likely not seek approval from VCCS for Workforce Credential Grant noncredit tuition support. Thus, the degree to which individual colleges have sufficient resources for workforce development programs directly impacts employers' access to workers who have earned industry recognized credentials. Resources such as adequate support staff, equipment, facilities, technology, and qualified faculty are needed to run expensive programs such as welding, machining, and truck driving (JLARC, 2017). Limited research is available about the demand for noncredit programs

in community colleges (D'Amico, Morgan, Katsinas, and Miller (2017). Landon (2009) conducted research almost ten years ago which studied current and emerging trends impacting workforce development programs in Virginia.

Purpose Statement and Research Questions

My focus was to identify industry-recognized workforce credentials in demand by employers now and in the future in Virginia. As mentioned earlier, my research questions were as follows:

1. What industry-recognized workforce credentials are currently in high demand by Virginia employers, and what industry-recognized workforce credentials are likely to be in high demand in the future?

   a. Are workforce credentials in the field of health care currently being demanded most by Virginia employers, and will they likely be demanded most in the future?

2. What industry-recognized credentials are currently in demand of employers based on stakeholder type?

3. How do current and future demand for industry-recognized workforce credentials compare amongst rural and urban regions of Virginia?

Summary

I surveyed a targeted group of Virginia workforce development stakeholders, including 17 Virginia Community College System workforce development leaders who represent each local community college, 47 Virginia local and regional economic development directors, and 11 Virginia Workforce Innovation Opportunity Act d(WIOA) directors. After the survey was closed, the analysis showed that 99 of 151 opened the survey; of these, 24 were removed due to incomplete demographic or survey data, leaving 75 individuals, for a completion rate of 49.7%.

The core research questions of this study focused on which workforce credentials were most in demand in Virginia, and on whether this demand varied according to stakeholder preference or according to geographical region. I also had a particular interest in whether health care remained in high demand, since the most recent survey of credential program interest (from a decade ago) identified it as much desired. These questions guided the survey design, data analysis, and its relevance to the planning efforts of the VCCS workforce development leaders.

Discussion of Results in Relation to the Literature

Credentials in Demand: Then, Now, and in Future

Almost a decade ago, Landon (2009) identified the highest demand for industry-recognized credentials to be in the field of health care. It is not surprising that the results of my study indicate that the health care industry continues to be in high demand: the baby boomer generation's demand for health care services, together with the implementation of the Affordable Care Act (ACA), have increased the need for health care services (Buerhaus, Skinner, Auerbach & Staiger, 2017). According to Osterland (2016), there is a high demand for credentialed workers in allied health care as well as licensed nurses. The current study found that health care and social assistance credentials such as licensed practical nurse, registered nurse, and certified nurse aide to be highly ranked (22%). By the year 2024, BLS (2016) projects that health care and fields related to health care will be the largest division of employment in the U.S. economy.

Yet this study also reveals a significant departure from Landon: by nearly all measures, the demand for credentials in manufacturing has come to equal the demand in health care. A comparison with Landon's findings may be instructive. In her study, certified nursing assistant emerged as the credential highest in demand, and respondents identified health care as the most desired program offered by VCCS colleges. By comparison, credentials in the field of

manufacturing were far less popular according to her study: welding ranked only fourth in the list of top in-demand programs, and machining ranked twelfth. This study agreed with Landon's findings that health care credentials are in high demand and are expected to continue so in the future. However, this study found that manufacturing-related credentials, such as welding, machining, and manufacturing technician, have risen in popularity over the past decade, attracting a demand equal to that of health care.

The difference between my findings and those of the earlier literature raises the question of what happened in the manufacturing field in the last decade. There are probably several reasons for this change, some of them having to do with fluctuations in the global economy. Manufacturing has experienced a resurgence in the past several years. Since January 2010, the U.S. manufacturing industry has increased by almost 600,000 jobs (Manufacturing Institute, 2018). According to the Bureau of Labor Statistics manufacturing employment in Virginia has increased in the last decade; In December 2009, Virginia manufacturers employed 233,500 workers as compared to September 2018 data which shows 243,100 workers employed by manufacturers, an increase of 9,600 (4.1%) workers (BLS, 2018). During the first quarter of 2018, manufacturers supported $2.33 trillion to the U.S. economy; an increase from the second quarter of 2009 when manufacturing supported $1.70 trillion (Bureau of Economic Analysis, 2018). Since the Great Recession, manufacturing companies have employed an additional 1.3 million workers (BLS, 2018). The future of manufacturing is extremely optimistic. Over the next decade, almost 3.5 million manufacturing jobs are predicted to be needed and 2 million are expected to go unfilled due to a skills gap (NAM, 2018). According to a recent report by Deloitte and the Manufacturing Institute, 80% of manufacturers indicate a moderate or serious

shortage of qualified workers for skilled or highly technical production jobs (Manufacturing Institute, 2018).

This shift in comparative demand between health care and manufacturing highlights one of the values of updating the research on this topic: the economy does not stay the same, and community colleges need to attend to the changes in order to make appropriate plans for which programs they wish to expand and which they wish to shrink. I discuss these ideas in more detail below, in the recommendations section.

Lack of Resources

Virginia legislators implemented the New Economy Workforce Industry Credential Grant Program, which provides tuition support for students enrolled in approved workforce development high-demand programs at VCCS colleges (VCCS, 2017a). However, according to JLARC (2017), some community colleges are limited in their ability to offer specific noncredit, short-term credential-based programs due to a lack of resources. Indeed, previous research has noted the problem of scant resources in community college education, and recommended various remedies. My study extends this line of research by identifying various resources needed by VCCS colleges to fully meet the demand for highly sought credential-based training. I categorized participants' responses (Appendix J) into themes such as facilities, staff support, funds, qualified instructors, employment opportunities, equipment, tuition support, employers, and curriculum/policy/other.

Through the Virginia WCG program, VCCS receives partially subsidized tuition support for each qualifying student who enrolls in an approved workforce development program for high-demand credentials. Virginia has established a list called the New Economy Workforce Industry Credential Grant Program that identifies noncredit, short-term credential-based

programs approved for WCG tuition support at each community college (VCCS, 2017a).

However, some community colleges cannot offer specific noncredit, short-term credential-based

programs due to a lack of resources (JLARC, 2017). Thus, more current and comprehensive data

are needed to identify employers' demand for industry recognized credentials offered in a short-

term noncredit format in local regions.

The needs for Virginia community colleges are evident in the survey responses from

workforce development stakeholders. The largest number of responses (19.6%) were related to

the need for additional funds or cash (Appendix J); one respondent stated "money, money,

money." Participants described various needs for funding which included marketing, instructors,

outreach to high schools and community partners, expansion of programs, implementation of

new programs, and more resources to allow flexibility to meet employers' training needs. The

next largest number of responses (14.3%) related to the need for additional staff support to

handle the increased administrative duties resulting from a higher demand for workforce

development training. Comments concerning the need for facilities (14.3%) reflect programming

limitations due to the lack of sufficient classroom space and facilities to meet the local demand

for workforce development training. The need for equipment (12.5%) to offer in demand

credential training was also prevalent. One respondent noted the need for equipment to offer

programs in dental assistant training, physical therapy assistant training, and occupation therapy

assistant training. Without proper state of the art equipment, local community colleges cannot

develop and implement proper workforce development programs. Thus, employers' access to

workers with high demand credentials is directly impacted.

Critical Thinking

Critiques such as that by Norton and Wilson (2015) have argued that community colleges do not sufficiently prepare individuals to think critically in the work environment. While community college workforce development programs improve workers' skills through vocational short-term credential based programs, they do not emphasize reasoning skills and the ability to solve problems in the workplace (Norton & Wilson, 2015). My study uncovered responses that resonated with this critique, despite the fact that they came from people committed to translating education into practical employment. A number of respondents emphasized the need for VCCS colleges to include critical thinking skills into workforce development curriculum. One respondent even rated these skills higher than credentials themselves: "Short-term training meets a specific purpose, but it does not always prepare an individual with the critical thinking skills and work ethic needed to do a job. Most in this region are not interested in credentials. They want individuals who have the ability to adapt, learn on the job and the willingness to show up and work." Comments such as this one reveal the ongoing tension between the need to provide a specific set of skills matched to a particular field, on the one hand, and the need to provide a broad set of critical and communication aptitudes that translate across multiple fields, on the other.

<div align="center">

Recommendations

</div>

The most striking results of my study are that not only has manufacturing caught up with health care in current credentialing demand, but stakeholders predict that the two fields will continue to stay even in the foreseeable future. Thus, although community colleges should continue to invest in and maintain their credential programs in health care, my study strongly suggests that they should expand the credentials offered in manufacturing. Specifically,

educators can expect a high demand for welders certified by American Welding Society (AWS), machinists and maintenance technicians. Machinists can be certified through the National Institute for Metalworking Skills (NIMS). Workers with manufacturing related credentials will help employers.

The findings of my study also have implications for other areas of community college education and preparation. For one thing, the two credential areas my study identifies as most desirable—manufacturing and health care—are among the areas most susceptible to fluctuations in the global economy. The technological requirements of employers in these fields are fluid and often hard to predict, not least because of the pressures of global competition (O'Lawrence, 2017). Skilled workers who hold credentials in high-demand skills are vital in order for the United States to compete on a global scale (Chandler, 2011). This means the community colleges, even as they focus on regional needs, must also keep their eye on the global stage in an effort to anticipate future needs in the fields of manufacturing and health care.

Stackable Credentials

The findings in this study identify the need for workers who hold high demand credentials in the field of health care as well as manufacturing. Workers who hold stackable credentials, which is holding several credentials in a related field of study, not only increase their marketability in the job market but also increase their earnings potential (Carnevale, Jayasundera, & Hanson, 2012). Thus, one implication of this study is for community college workforce development divisions to develop, deliver and market more comprehensive workforce development programs that help workers to earn stackable credentials. For example, a worker who holds credentials in certified nursing assistant, medicate aide, and phlebotomy would be highly marketable in the field of health care. Likewise, a worker who holds stackable credentials

in the manufacturing field such as in machining and welding, can likewise increase their earnings potential.

Furthermore, my study implies some ways that colleges might use credential programs to help workers in rural areas of Virginia, a matter of ongoing concern for employers and community college administrators. For example, this study found a disparity in perceptions of stakeholders from rural areas compared to those from suburban/urban areas. While overall manufacturing and health care credentials were equally desired, rural participants in particular favored the former over the latter. The difference was not statistically significant, but it is still something to which community collages should pay attention. Credential programs in manufacturing require a good deal of resources, and, as JLARC (2017) has noted, it is precisely a lack of such resources that prevent some rural community colleges from delivering needed training programs. Rural colleges seeking grant funding for their credential programs could cite the particular need for manufacturing training in their region.

It is well known that community colleges struggle for the funding to support financial aid for workforce development students. Perhaps unsurprisingly, my study confirms this sense of need. One participant observed that "more funding is needed for credential based training tuition," and another expressed a wish for "additional tuition assistance that will last throughout the entire fiscal year." Current WCG funding levels still don't meet the demand of Virginians. VCCS colleges are running out of funds before the end of the fiscal year (JLARC, 2017).

In accordance with participants' suggestions about how the VCCS can better serve, community college leaders should consider how implementation of new programs can increase the workload of existing staff, require increased additional staff to oversee fiscal management

and limit use of existing facilities. Such programs can strain availability of classroom space and support staff needed to manage complicated policies and programs.

Finally, my study offers some guidance to community colleges about the difficult decision of which programs to shrink or eliminate. For example, my study found that current demand for credentials related to education services (5.3%), retail trade (1.3%) and management of companies (1.3%) were ranked lowest. In regard to future demand, credentials in the fields of education services (5.3%) and management of companies and enterprises (1.3%) were ranked lowest. Thus, based on these findings, I recommend that VCCS colleges consider reducing or terminating workforce development programs related to these fields. Since resources are limited at some VCCS colleges, budget allocations, equipment and staff can be diverted to more high demand credential based programs such as health care and manufacturing.

Future Research

This study has sought to fill the gap in the literature on employer demand for industry-recognized workforce credentials delivered through community colleges. In particular, the study reveals a dramatic change in the comparative demand for credentials in health care and manufacturing: although considerably lower in the past, manufacturing has caught up to health care in the last decade. Yet, naturally, this study also raises questions as well as answering them. For example, we might have expected rural areas to express credential needs different from those expressed in urban areas, but my survey did not reveal statistically significant variations between the two regional groups. Why not? And should community colleges expect this lack of variation to continue into the future? This issue emerges from my study as an area in need of further research.

This study did not include employers as part of the research population. Since the need for workers to hold industry-recognized credentials most directly impacts employers across Virginia, future research is recommended on a more comprehensive level. Future research should include employers from all industry clusters and all geographic regions to dive deeper into the demand for credentials.

My research identified an increase in the demand for manufacturing related credentials in Virginia. Since the need of employers for industry-recognized credentials in manufacturing has increased over the last ten years in Virginia, future research is needed in this area. Research conducted in the future might focus solely on manufacturers across Virginia as well as other surrounding states. The current political climate with the Trump administration, strained relations with China and other countries could have an impact on manufacturing in the future.

Future studies should include research methods that go beyond a single electronic survey. A more comprehensive approach that includes, surveys, interviews and local focus groups should help to gain more in-depth knowledge about employers' demand for industry-recognized credentials.

My study is a descriptive one. In chapter III, I noted the various limitations that accompany surveys of the sort I used, as well as limitations specific to my survey. Misapplied coding and subcoding can impact the accuracy and validity of the research study (Creswell, 2009). I distributed the survey to workforce development employees holding specific professional positions, and some of these positions may have been vacant when I sent it. (As I mentioned, the response rate was 49.7%). Furthermore, some counties, particularly rural ones, did not have a designated position for economic development, and so I was forced to approximate the position by sending the survey to the county administrator. Finally, the open-

ended questions covered divergent topics, which helps to gather a range of information but may result in a lack of cohesion since it is difficult to code a large span of categories. All of these issues call attention to the need for further, target-specific quantitative studies in the future that can drill down into the issues my descriptive study has revealed.

Limitations

Beyond the limitations I have just mentioned in relation to future research, I should conclude this chapter with some comments about the challenges this study faced and how I attempted to ameliorate them. The extent to which research results can be generalized to other contexts is referred to external validity (Leedy & Ormrod, 2013). Due to the methodology used and the target population, my results may not be generalizable to other VCCS-associated individuals or stakeholders; similarly, since the focus of this study was on the needs of Virginia employers, the findings are likely not generally applicable to other states. Another limitation is that participants' responses to the electronic survey are subject to human error, potential lack of or limited experience in the field of workforce development, and the bias(es) of respondents. Researcher bias may also have resulted from my close connection with workforce development programs offered at a community college. I have worked at a VCCS college for several years and I have extensive experience in workforce development training. Due to this personal connection to workforce development, one challenge was to make an intentional effort to bracket my potential assumptions and biases to prevent "reading into" comments from participants. The descriptive survey methodology I used was limited to a survey which included both closed-ended and open-ended questions. A more comprehensive methodology such as mixed methods could capture a more in-depth collection of data by not only distributing a survey but also interviewing survey participants. Descriptive research can further be limited by a researcher's decisions as to

what data will be recorded and emphasized in the results; I took care to avoid this by including participants' responses in this dissertation. Another limitation on the generalizability of my results is that employers were not included in the targeted survey population; thus, their firsthand knowledge of their need for industry recognized credentials could not be obtained. My ordering of my survey questions also presents a (procedural and logistical) limitation; since the demographic questions were located at the end of the survey; some participants (n = 24) ceased responding to the survey before completing the demographic questions. Although I addressed this as much as possible by using respondents' email addresses to obtain necessary information on stakeholder type, geographic region served, and years of experience (where possible), several participants' data could not be used due to the absence of key demographic information.

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Appendix A

Map of Virginia Community College System
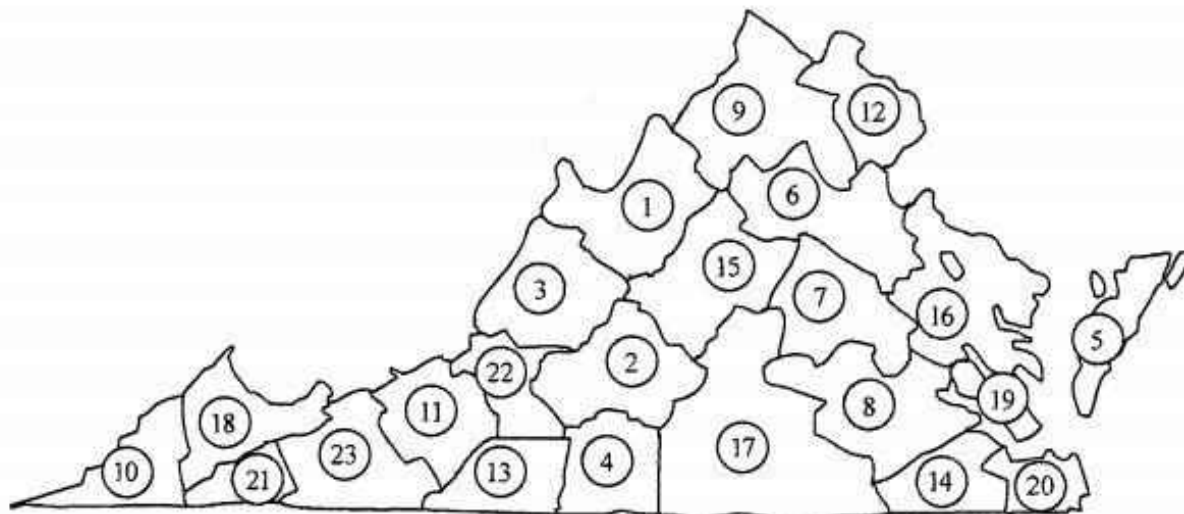
1 Blue Ridge	9 Lord Fairfax	17 Southside Virginia
2 Central Virginia	10 Mountain Empire	18 Southwest Virginia
3 Dabney S. Lancaster	11 New River	19 Thomas Nelson
4 Danville	12 Northern Virginia	20 Tidewater
5 Eastern Shore	13 Patrick Henry	21 Virginia Highlands
6 Germanna	14 Paul D. Camp	22 Virginia Western
7 *Reynolds	15 Piedmont Virginia	23 Wytheville
8 *John Tyler	16 Rappahannock	

Note: Reynolds and John Tyler created the Community College Workforce Alliance (CCWA) in 2003 to provide a collaborative resource for their region. (Reynolds Community College, 2009)

Appendix B

Virginia Community College Service Regions

Blue Ridge Community College: the cities of Staunton, Harrisonburg, Waynesboro, and the counties of Augusta, Highland, and Rockingham.

Central Virginia Community College: The cities of Lynchburg and Bedford, and the counties of Amherst, Appomattox, Bedford and Campbell.

Dabney S. Lancaster Community College: The cities of Buena Vista, Clifton Forge, Covington, and Lexington, and the counties of Alleghany, Bath, Botetourt (Northern portion), and Rockbridge.

Danville Community College: The cities of Danville and South Boston (shared with Southside Virginia Community College), and Halifax (western portion) and Pittsylvania counties.

Eastern Shore Community College: The counties of Accomack and Northampton.

Germanna Community College: The city of Fredericksburg and the counties of Caroline, Culpeper, King George (shared with Rappahannock Community College), Madison, Orange, Spotsylvania and Stafford.

*John Tyler Community College: The cities of Colonial Heights, Hopewell and Petersburg, and the counties of Amelia, Charles City, Chesterfield, Dinwiddie, Price George, Surry, and Sussex.

Lord Fairfax Community College: The city of Winchester and the counties of Clarke, Fauquier, Frederick, Page, Rappahannock, Shenandoah, and Warren.

Mountain Empire Community College: The city of Norton and the counties of Dickenson (western portion), Lee, Scott, and Wise.

New River Community College: The city of Radford and the counties of Floyd, Giles, Montgomery, and Pulaski.

Northern Virginia Community College: The cities of Alexandria, Falls Church, Fairfax, Manassas, and Manassas Park, and the counties of Arlington, Fairfax, Loudoun, and Price William.

Patrick Henry Community College: The city of Martinsville and the counties of Franklin (southern portion), Henry, and Patrick.

Paul D. Camp Community College: The cities of Franklin and Suffolk (south of routes 125 and 337) and the counties of Isle of Wight and Southampton.

Piedmont Virginia Community College: The city of Charlottesville and the counties of Albemarle, Buckingham (northern portion), Fluvanna, Greene, Louisa (shared with Reynolds Community College), and Nelson.

Rappahannock Community College: The counties of Essex, Gloucester, King and Queen, King George   (shared with Germanna Community College). King William, Lancaster, Mathews, Middlesex, New Kent, North Cumberland, Richmond, and Westmoreland.

*Reynolds Community College: The city of Richmond, and the counties of Goochland, Hanover, Henrico, Louisa (Shared with Piedmont Virginia Community College), and Powhatan.

Southside Virginia Community College: The cities of Emporia and South Boston (shared with Danville Community College), and the counties of Brunswick, Buckingham (southern portion), Charlotte, Cumberland, Greensville, Halifax (eastern portion), Lunenburg, Mecklenburg, Nottoway, and Prince Edward.

Southwest Virginia Community College: The counties of Buchanan, Dickenson (eastern portion), Russell and Tazewell.

Thomas Nelson Community College: The cities of Hampton, Newport News, Poquoson, and Williamsburg, and the counties of James city and York.

Tidewater Community College: The cities of Chesapeake, Norfolk, Virginia Beach, Portsmouth, and Suffolk (north of routes 125 and 337).

Virginia Highlands Community College: The city of Bristol and the counties of Smyth (western portion) and Washington.

Virginia Western Community College: The cities of Roanoke and Salem, and the counties of Botetourt (southern portion), Craig, Franklin (northern portion), and Roanoke.

Wytheville Community College: The city of Galax and the counties of Bland, Carroll, Grayson, Smyth (Marion and eastward), and Wythe.

(State Board for Community Colleges, 2008, pp.1-3)

*Note. Reynolds (formerly J. Sergeant Reynolds) and John Tyler created the Community

College Workforce Alliance (CCWA) in 2003 to provide a collaborative resource for their

regions (J. Sargeant Reynolds Community College, 2009)

Appendix C

Survey

HIGH-DEMAND INDUSTRY-RECOGNIZED WORKFORCE CREDENTIALS

In this survey, please provide feedback about high demand industry-recognized workforce credentials that you believe will be NEEDED BY EMPLOYERS in your local area both currently and five years from now.

Based on number of employees, what are the CURRENT top 5 industry clusters of EMPLOYERS in your area? (Click to RANK BASED ON HIGHEST NUMBER OF EMPLOYEES #1 AND LOWEST NUMBER AS #5)

( ) Accommodation and Food Services

( ) Administrative and Support and Waste Management and Remediation Services

( ) Agriculture, Forestry, Fishing and Hunting

( ) Arts, Entertainment, and Recreation

( ) Construction

( ) Educational Services

( ) Finance and Insurance

( ) Health Care and Social Assistance

( ) Information

( ) Management of Companies and Enterprises

( ) Manufacturing

( ) Mining, Quarrying, and Oil and Gas Extraction

( ) Other Services (except Public Administration)

( ) Professional, Scientific, and Technical Services

( ) Real Estate and Rental and Leasing

( ) Retail Trade

( ) Transportation and Warehousing

( ) Unclassified (Other)

( ) Utilities

( ) Wholesale Trade

In your local area, which industry cluster listed below needs industry-recognized workforce credentials the MOST?   (Click to select one INDUSTRY CLUSTER)

( ) Accommodation and Food Services

( ) Administrative and Support and Waste Management and Remediation Services

( ) Agriculture, Forestry, Fishing and Hunting

( ) Arts, Entertainment, and Recreation

( ) Construction

 ( ) Educational Services

( ) Finance and Insurance

( ) Health Care and Social Assistance

( ) Information

( ) Management of Companies and Enterprises

( ) Manufacturing

( ) Mining, Quarrying, and Oil and Gas Extraction

( ) Other Services (except Public Administration)

( ) Professional, Scientific, and Technical Services

( ) Real Estate and Rental and Leasing

( ) Retail Trade

( ) Transportation and Warehousing

( ) Unclassified

( ) Utilities

( ) Wholesale Trade

In the next 5 years, which top 5 industry clusters will have the HIGHEST DEMAND FOR A CREDENTIALED WORKFORCE in your local area? (Click to RANK BASED ON HIGHEST IN DEMAND AS #1 AND LOWEST IN DEMAND AS #5)

( ) Accommodation and Food Services

( ) Administrative and Support and Waste Management and Remediation Services

( ) Agriculture, Forestry, Fishing and Hunting

( ) Arts, Entertainment, and Recreation

( ) Construction

( ) Educational Services

( ) Finance and Insurance

( ) Health Care and Social Assistance

( ) Information

( ) Management of Companies and Enterprises

( ) Manufacturing

( ) Mining, Quarrying, and Oil and Gas Extraction

( ) Other Services (except Public Administration)

( ) Professional, Scientific, and Technical Services

( ) Real Estate and Rental and Leasing

( ) Retail Trade

( ) Transportation and Warehousing

( ) Unclassified (Other)

( ) Utilities

( ) Wholesale Trade

In your experience, how important is it for EMPLOYEES in your local area to hold industry-recognized workforce credentials? (Click to select one response)

( ) Not Important ( ) Somewhat Important ( ) Important ( ) Very Important ( ) Extremely Important

In the next five years, how important will it be for EMPLOYEES in your local area to hold industry-recognized credentials?   (Click to select one response)

( ) Not Important ( ) Somewhat Important ( ) Important ( ) Very Important ( ) Extremely Important

To what degree have local EMPLOYERS relied on the community college(s) in your area to provide industry-recognized credential-based workforce training? (Click to select one response)

( ) Never ( ) Seldom   ( ) Sometimes ( ) Often ( ) Almost always

In the NEXT FIVE YEARS, to what degree will local EMPLOYERS use the community college(s) in your area to provide industry-recognized credential-based workforce training? (Click to select one response)

( ) Never ( ) Seldom ( ) Sometimes ( ) Often ( ) Almost always

In your opinion, if local EMPLOYERS have used local community colleges to meet their workforce training needs, how satisfied were they with the overall training? (Click to select one response)

( ) Not satisfied   ( ) Almost satisfied ( ) Satisfied   ( ) Very satisfied   ( ) Extremely Satisfied

Please **IDENTIFY** and **RANK** the top ten industry-recognized credentials **CURRENTLY** needed by employers in your local area.   (RANK BASED ON HIGHEST IN DEMAND AS #1 AND LOWEST IN DEMAND AS #10)

_____

_____

_____

_____

_____

In the next 5 years, what will be the TOP 10 HIGH DEMAND INDUSTRY-RECOGNIZED CREDENTIALS needed by employers in your local area? (RANK BASED ON HIGHEST IN DEMAND AS #1 AND LOWEST IN DEMAND AS #10)

_____

_____

_____

_____

Please list SPECIFIC RESOURCES needed by your local community college that would help expand existing or develop new workforce development industry-recognized credential based training programs. (Some community colleges lack critical resources to develop and deliver high demand programs needed by employers. Help us identify what resources are lacking.)

_____

_____

_____

_____

How can administrators of the Virginia Community College System better serve individuals and employers with development of a highly skilled and credentialed workforce? Please be specific.

_____

_____

_____

Which stakeholder group do you identify with?

{Click to select all that apply)

( ) VCCS Workforce Development leader

( ) Workforce Innovation Opportunity Act Director

( ) Local County or City Economic Development Director

( ) Regional Economic Development Director

How would you describe the geographic area you serve?

(Click to select best category)

( ) Rural area

( ) Urban

( ) Suburban

How long have you been involved in assisting employers with their workforce development staffing and training needs?

{Click to select one category)

( ) <1 year

( ) 1-5 years

( ) 6-10 years

( ) >10 years

Appendix D

Expert Panel Survey Rating Form

On the attached form, please check one level for each question to provide constructive feedback on the survey instrument. A Likert scale of 1 to 5 where 1 means Not at all and 5 means Completely.

1. Not at all
2. Some
3. Adequate
4. Almost Completely
5. Completely

Please add any comments that will add clarity of content, visual symmetry, and ease and efficiency in completing the survey.

1. To what degree did the survey fulfill the data collection needs of the study as defined in the Statement of the Problem and the Research Goals (attached)?	1. Not at all	2. Some	3. Adequate	4. Almost Completely .	5. Completely
Comments:					
2. To what degree were the directions for completing the overall survey clear?	1. Not at all	2. Some	3. Adequate	4. Almost Completely	5. Completely
Comments:					
3. To what degree was the layout of the survey easy to read?	1. Not at all	2. Some	3. Adequate	4. Almost Completely	5. Completely

Comments:					

4. Were the statements clear?	1. Not at all	2. Some	3. Adequate	4. Almost Completely	5. Completely

Comments:					

5. Were there any grammatical or spelling errors?	1. Not at all	2. Some	3. Adequate	4. Almost Completely	5. Completely

*(Please mark on the document or
note here specifically)*

Comments:					

OLD DOMINION UNIVERSITY

| **Appendix E** | **OFFICE OF THE VICE PRESIDENT FOR RESEARCH** |

PROUDLY, AN AAALAC ACCREDITED PROGRAM

DATE: August 22, 2018

TO: Shana Pribesh, Ph.D.
FROM: Old Dominion University Education Human Subjects Review   Committee

PROJECT TITLE: [1299517-1] High Demand Workforce Credentials
REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: August 22, 2018

REVIEW CATEGORY: Exemption category # *6.2*

Thank you for your submission of New Project materials for this project. The Old Dominion University Education Human Subjects Review Committee has determined this project is   EXEMPT FROM IRB REVIEW according to federal regulations.

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

If you have any questions, please contact Laura Chezan at (757) 683 -7055 or lchezan@odu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Old D   ominion University Education Human Subjects Review Committee's records.

                        Generated on IRBNet

Appendix F

INFORMED CONSENT FORM

Introduction

This study will collect data about high demand industry-recognized workforce credentials you believe will be needed by employers in Virginia.

Procedures

To determine which industry-recognized workforce credentials will be needed by employers now and in the next five year, we ask that you complete a brief survey that should take 10 minutes or less to complete. You as well as approximately 170 other workforce development professionals including Virginia Community College System workforce leaders, Virginia Workforce Investment Opportunity Act directors, and both local and regional Virginia economic development directors in Virginia have the best vantage point for identifying and predicting employer needs.

Risks and Benefits

Risks are minimal. Your identity will remain confidential. While there are no direct benefits for survey participants, current data is needed regarding trends related to current and future industry recognized credentials needed by employers. This data will provide new information that will help workforce development stakeholders to make strategic decisions regarding new curriculum and economic development.

Confidentiality

All data obtained from survey participants will be kept <u>strictly confidential</u> and will only be reported in an aggregate format (by reporting only combined results and never reporting individual ones). All surveys will be maintained on a secure server and no one other than the primary investigator and co-researchers will have access.

Compensation

A two-dollar bill will be mailed as a token to encourage official survey participants to complete the electronic survey.

Participation

Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely.

Questions about the Research

If you have questions regarding this study, you may contact the Responsible Project Investigator, Dr. Shana Pribesh, Professor of Educational Foundations, Old Dominion University at 757-683-6684 or spribesh@odu.edu or the assistant investigator, Debra K. Smiley, Doctoral student, at 434-917-3746 or debra.smiley@southside.edu. You may also contact the chair of the DCOE Human Subjects Research Committee, Dr. Laura Chezan at lchezan@odu.edu.

If you agree to participate in this study, please click YES on the following:

YES (if yes, go to next question)

NO (if no, exit survey)

Appendix G

Introductory Letter

August 20, 2018

Dear [name of recipient],

I am writing to ask for your help with an important study to identify industry-recognized workforce credentials that are in high-demand by Virginia employers now and five years from now. Specifically, I am asking that you complete a brief survey that will be sent to you in the next few days. You will receive an email with a URL linking you to the survey. This on-line survey should not take more than 10 minutes of your time.

By taking a few minutes to share your perceptions about industry-recognized credentials needed by local employers, you will help workforce development stakeholders to make decisions that impact curriculum and economic development in Virginia. If you have any questions, please feel free to contact me or the Responsible Project Investigator, Dr. Shana Pribesh.

Sincerely,

Debra

Debra K. Smiley   Dr. Shana Pribesh

ODU doctoral candidate   Educational Foundations & Leadership

debra.smiley@southside.edu   Old Dominion University

Phone: 434-917-3746   Darden School of Education

                                                                 Office 757-683-6684

                                                                 spribesh@odu.edu

Appendix H

CITI
PROGRAM

Completion Date 23-Feb-2018
Expiration Date 23-Feb-2019
Record ID 26301965

This is to certify that:

debra smiley

Has completed the following CITI Program course:

Social & Behavioral Research - Basic/Refresher (Curriculum Group)
Social & Behavioral Research - Basic/Refresher (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Old Dominion University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w1309b732-0774-4212-ad57-335f6087971f-26301965

Appendix I

Raw data. Current top industry recognized credentials needed by employers

(Survey question #9)

Ranked #1	Ranked #2	Ranked #3	Ranked #4	Ranked #5
CNA	RN	CDL	Welding	Advanced Manufacturing
Work Keys	ACT Work Ready Communities	unknown	unknown	unknown
CDL	CMA	Welding AWS	Welding ASME	LPN
A+	Security +	CNA	PCA	NCCER
Welding	HVAC	CNC	ACT Work Read	IT
Nursing	Construction	Cybersecurity	Hvac	Machinist
Machining	Welding	Robotics/Automation	PLC Programming	Sensory
IT	Na	Na	Na	Na
VDT Asphalt certifications	CDL	Electrical NCCER	Plumbing NCCER	HVAC NCCER
RN	Other health care	Various IT	Engineering	Machining
construction	HVAC	Health care	manufacturing	logistics
MTI	Heavy Equipment Operator	CDL	blank	blank
American Welding Society Certified Welder	Commercial Drivers License Class A	Microsoft Digital Literacy	CompTIA IT Fundamentals	ServSafe
HVAC	General Construction	Technology	Engineering	Food processing
CPR	OSHA	CDL A	Welding	Teacher Licenses
CDL A	CMA	CNA	NCCER Core	HVAC
Truck driving	Welding	CMT programming	Electrician	Tool and die maker
ACT Work Keys	ACT Work Keys	ACT Work Keys	ACT Work Keys	ACT Work Keys
Work Keys	Welding	Pharmacy Tech	HVAC	CNA
Mcsd	Mta	Ancc (RN)	Cna	Elementary ed
Forklift driver	Mechatronics	Metal worker/CNC	Welding	Electrical
Engineering	Fork lift operators	heavy equipment operators	welding	CDL Drivers
RN/LPN/CNA	CDL	Lineman	EMS	Welding NCCER or AWS

Registered Nurse Certification	Commercial Drivers License Class A	Certified Nursing Assistant	Licensed Practical Nurse	Manufacturing Technician I
Government security clearance	AWS	CISSP	don't know	don't know
LPN	RN	Lab Technicians	AWS Welding	NIMS Machining
National Career Readiness Certificate (NCRC)	CompTIA A+	Certified Coding Associate (CCA)	Commercial Electrician	Industrial Maintenance Mechanic
Nursing	Nurse Aide	CPR	CDL	Medical Assisting
AWS	NCCER	CDL	MBC	CMA
First Aid/CPR/AED	CDL Class A	Shielded Metal Arc Welding (SMAW)	Certified Nursing Assistant	Pharmacy Technician
Registered Nurse	Commercial Drivers License	Manufacturing Technician 1	Medical Administrative Assistant	Medical Professional Coder
CDL	CAN	OSHA 10	AWS	NAPA
Commercial Driver's License	Nursing (LPN, Nurse Pract.,CCRN, AS in Nursing, CNA	3. Licensed Clinical Social Worker (LCSW	4. Licensed Professional Counselor (LPC)	5. Certified Public Accountant
Certified Nurse Aide	Medication Aide	Welding	NIMS	CDL
CDL class A	ServSafe	OSHA	Pharmacy Technician	CompTia N+
Welding	PMP	Cisco	Electrical	Logistics
Security clearance	Drivers license	CDL Class A	CompTia Security+	CISSP
Health Care	Educational Services (higher education)	manufacturing	trucking	n/a
Class A CDL	Basic Life Support Certification	Certification in CPR	Certified Public Accountant	Advanced Cardiac Life Support Certification (ACLS)
Registered Nursing license	Commercial drivers license	Food Safe?? Lots of restaurants....	tough to answer after 1 and 2. What I think is "in demand" is subjective. only employers should be asked questions 12 through 21.	tough to answer after 1 and 2

Trades	Health Services	Manufacturing	Information	Logistics
Nursing	CAN	Teaching	Power Line Worker	Machining
Management	Construction	Hospitality	Education	light manufacturing
unaware	unaware	unaware	unaware	unaware
RN's/CNA	Phlebotomy/CT Imaging	Maintenance Technicians	Communications/IT certifications/cyber security	Work Ready (soft skills)
cdl driver	small equipment operator	BLS/ALS	teaching degree	HVAC
Workforce Readiness (by a lot)	Basic Life Support	OSHA	CPR	CDL
Welding	CNC machining—NIMS	electrical	Plumbing	HVAC
industrial maintenance	welding	precision machinist	hvac	electrical
Welding	Truck Drivers	Food Service	Agricultural equipment operations	Forestry equipment operation
Welding	Truss Manufacturing	Fiberglass	GED	na
Certified Registered Nurse (RN)	Certified Information Systems Security Professional (CISSP)	Commercial Drivers License (CDL)	Project Management Professional (PMP)	Certified Public Accountant (CPA)
nursing	food service	welding	Emergency Medical Technician	marine trades
manufacturing technician certification	logistics technician certification	food preparation services certificate	n/a	n.a
BSN	CDL Class A	CNA	LPN	Fork Lift Operator
Certification in Cardiopulmonary Resuscitation (CPR)	Certified Information Systems Security Professional (CISSP)	Project Management Professional (PMP)	Basic Life Support (BLS)	Registered Nurse (RN)
Unknown	Unknown	Unknown	Unknown	Unknown
welding	machinest	Problem solving	soft skills- showing up to work on time-properly dressed	electrical

RN	Welder	Electrician	MD	PA
Welding	CDL	Maintenance Mechanic	Electrician	RN
Electrical	HVAC	Plumbing	Customer Sales and Service	CDL
Cyber Security	Mechatronics	Welding	Information Systems	Road Building
Commercial Driver's License (CDL)	Licensed Practical Nurse	CompTIA Security+	Nurse Practitioner	Critical Care Registered Nurse (CCRN)
Health Care & Social Assistance	Advanced Manufacturing	Information Technology	Leisure & Hospitality	Research and Development
Food Service	Construction	Financial Services	Technology	Manufacturing
Certified Nurse Aide	Registered Nurse	CDL Class A	Electrician	HVAC Technician
Welding	CDL License	Teachers	Home Health Aid	Licensed Practical Nurse
Electricians	Plumbers	Teachers	Doctors	Nurses
Manufacturing	Warehouse Distribution	Finance	Healthcare	1
Welding AWS?	Machining	CDL	Nursing	Educational credentials

Appendix J
Raw data. In the next five years, credentials needed by employers
(Survey question #10)

Ranked #1 Future	Ranked #2 Future	Ranked #3 Future	Ranked #4 Future	Ranked #5 Future
CNA	RN	CDL	Welding	Advanced Manufacturing
CDL	CMA	LPN	RN	Welding AWS
CNA	PCA	NCCER	A+	Security +
Cyber	Welding	ACT Work Ready	Automation	Fabrication
Cyber	Hvac	Ag	Machinist	Winemaking
Machining	Robotics	PLC	welding	sensory
IT	Trades	Trades	Trades	Trades
Any Cyber Certification	Data Center Technician certifications	Aphalt Certifications	CDL to unclude upgrades based on driverless car research	Electrical NCCER
construction	HVAC	Laboratory	Manufacturing	Health Care
MT1	Heavy Equipment Operator	CDL	blank	blank
American Welding Society Certified Welder	Commercial Drivers License Class A	CompTIA IT Fundamentals	CompTIA A+	CompTIA Network+
CDL	Electrical	HVAC	CMA	CNA
CPR	OSHA	CDL A	WELDING	ROBOT
CDL A	Manufacturing	Welding	CMA	Industrial Maintenance Welder
Maintenance Tech	Industrial maintenance	Electronics repair	Electrician	
No Choices given	No Choices given	No Choices given	No Choices given	No Choices given
Work Keys	Machinist	CDL	HVAC	Plumber
Not sure	Not sure	Not sure	Not sure	Not sure
Same	Same	Same	Same	Same
engineering	cdl drivers	heavy equipment operators	electricians	welders
RN/LPN/CNA	CDL	CCNA	Ethical Hacker	EMS
Registered Nurse	Level I NIMS for Machinists	Commercial Drivers License Class A	Certified Welder (AWS)	Commercials Drivers License Class B
government security clearance	AWS	don't know	don't know	don't know

RN	LPN	Welding	Mechatronics	Machining
Nursing	Nurse Aide	CPR	CDL	Medical Assisting
CDL	MBC	AWS	NCCER	A+
First Aid/CPR/AED	CDL Class A	Certified Nursing Assistant	Shielded Metal Arc Welding (SMAW)	Pharmacy Technician
Registered Nurse	Commercial Drivers License	Manufacturing Technician 1	Medical Administrative Assistant	Medical Professional Coder
CDL	CNA	OSHA 10	Medical Assisting	NAPA
Certified Nurse Aide	Medication Aide	Welding	Security +	Pharmacy Tech
CDL class A	NCCER Trades Electrician level 1	Pharmacy Tech	Phlebotomy Tech	NSF customer service and sales
Cyber Secruity related	Same	Same	Same	Same
security clearance	CISSP	AWS	RN	Project management
Clinical Medical Assistant	Certified Nurse Aide	CCNA	CISSP	Phlebotomist
Registered Nurse	Commercial Drivers License	Employers will know better than anyone else	Remember, employers don't always require a credential to hire, even though one may exist.	Employers will know better than anyone else
Welding	RN	Plumbing	Electrical	N/A
Nursing	IT Cyber Security	Electrical	Teaching	Welding
Construction	Management	Hospitality	Medicine	surveying
unaware	unaware	unaware	unaware	unaware
RN/CNA	Phlebotomy/CT imaging	Communications/IT certifications/cyber security	Records/coding/billing office specialist	Maintenance Technicians
medical doctor	physicians assistant	automation and production line	hospitality	office management
Workforce Readiness	Basic Life Support	CPR	CNC	CNA
Cybersecurity	Software/IT	Heathcare related to handling patient information and data	Transportation/Logistics	Trucking
Machinijh	Plumbing	Trades	Aa	Aa

industrial maintenance	precision machining	welding	health care	hvac
Welding	Manufacturing	Agricultural Equipment Operations	Forestry Equipment Operations	Nursing Hospitals
welding	truss	fiberglass	ged	na
Bachelors of Science in Nursing (BSN)	Certified Information Systems Security Professional (CISSP)	Commercial Drivers License (CDL)	Certified Nursing Assistant (CNA)	Certified Public Accountant (CPA)
Emergency Medical Technician	Nursing	Welding	Truck driving	cyber security
manufacturing technician certificate	logistics technician certificate	food prep certif.	na	na
BSN	CNA	LPN	CDL Class A	Welding
Certified Information Systems Security Professional (CISSP)	Project Management Professional (PMP)	Cisco Certified Network Associate (CCNA)	Certified Information Security Manager (CISM)	Advanced Cardiac Life Support Certification (ACLS)
Unknown welding	Unknown machinist	Unknown problem solving	Unknown soft skills	Unknown electrician
RN	PA	Electrician	Teacher	welder
Maintenance mechanic	machinist	electrician	electronics tech	CDL
HVAC	Plumbing	Electrical	Medical Assistant	Customer Sales
Cyber Security	Information Systems/Electronics	Manufacturing	CDL	Welding
Commercial Driver's License (CDL)	Licensed Practical Nurse	CompTIA Security+	Nurse Practitioner	Transportation Worker Identification Credential (TWIC) Card
Health Care &Social Assistance	Advanced Manufacturing	Unmanned Aerial Systems	Information Technology	Leisure & Hospitality
Food service	Agriculture	Technology	Lodging	Construction
Certified Nurse Aide	Registered Nurse	CDL Class A	Electrician	HVAC Technician

Welding	CDL License	Teachers	Home Health Aid	Nurses/Nurse Practiioners
Electricians	Plumbers	Teachers	Doctors	Nurses
AWS	Machining	CDL	Nursing	Education

Appendix K

Raw data. Resources needed by community colleges

Survey question #11. Raw data responses. Please list specific resources needed by your local community college that would help expand existing or develop new workforce development industry-recognized credential based training programs. (Some community colleges lack critical resources to develop and deliver high demand programs needed by employers. Help us identify what resources are lacking)	
Facilities	• Space • Classroom • Facilities and Space • Update labs • Additional Space • More room for technical equipment • Additional Technical Training facilities not shared by academic programs. • Offsite training locations to reach the masses • I understand that our Community College is looking for physical space for diesel mechanic training • Creation of centers of excellence with state of the art equipment. A good example is the Advanced Manufacturing center in Danville (DCC). • I believe that RCC could benefit from an Occupational Tech Center similar to that of SVCC. I feel that older people looking to be reeducated in a different field and intimidated by going to a college campus with 16-24 year olds. Having a separate location for workforce training for older people would seem to be a big step. • Equipment and lab space • Access to sufficient funding/resources that have the ability to develop impromptu programs as needed, at the appropriate scale, to mitigate pressure on competitive future growth. • Facilities for career and technical education programs—large rooms that allow for skills labs. Sufficient space to house the equipment. Flexible facilities to be able to easily transition the space from one CTE program to another. Storage space for the equipment when not in use • Physical space • Community colleges are not always the answer. See the SVAM Center of Excellence, for example. Advanced training is needed, too
Staff Support	• Personnel • Support Staff to work with students and employers • Staff • Demand is rising, and community college workforce departments are not adequately staffed • Funding for additional staff • Additional Staffing to handle the volume of eligible participants. • Increased ability to offer advertising • Ability to offer greater assistance with credential completion

	• Staff to promote programs/futures and education within the K-12 system • Outreach to parents of K-12 promoting home programs can turn into good jobs • Market trade jobs to middle and high school students that technical jobs are valuable careers the provide a great qualify of life • Liaisons between the community college and employers • Increased faculty staff to meet student demands in employment-critical study areas • Increased funding for additional staff • Funding staff connectivity to the businesses • Financial support to pay the instructors and staff.
Funds	• Funding • Support from local government • Financial Support • Money is always a concern • The major problem is that the federal government dollars for workforce development go to low/mod income citizens rather than to companies or colleges who need to train employees before they are hired. Fix the flow of workforce funds and direct them to organizations that actually add trained employees to the workforce. • Money to market these programs to potential work force • Better resources to accommodate customized training request • Financial Resources • Funding • The Workforce Credentials Grant has funded our most pressing needs: Tuition discounts, equipment, and personnel. Additional funding from other grant sources continues to support the same programs. So, currently, we do not lack any critical resources. • Funding to hire instructors. Funding for administration and promotion of fast forward. • outreach and recruitment to dislocated workers, high school graduates, and others in the community about opportunities • additional funding for program and the various resources needed to provide the raining and education needed to perform the tasks. • Much of what community colleges do is provide workforce skills, training and certifications which are based on new needs of existing companies or on needs of a new company moving into the area. There needs to be a more flexible budgeting and asset allocation process so that the cc can be more nimble and reactive in workforce issues related. In other words, allow them to keep providing core services and classes but flexibility to take on specific new curriculum/training for these economic development opportunities. • Increased Funding • Higher Funding • Money for career education and updates for public school teachers and guidance counselors to be more up to date on information about local

	• Financial resources • The two major initiatives that need support are a proposed manufacturing apprenticeship program and expansion of cyber security credentialing • Enhanced marketing of existing credential programs. Funding to expand credentialed offerings. • Funding to conduct off-site training and education (not online education) and apprenticeship programs. • Money, money, money
Qualified Instructors	• Qualified Instructors • Qualified instructors • Reliable Instructors • Skilled Educators • Training dollars and requirements for credentialed faculty • Trained Instructors • Properly trained instructors • Trained teaching staff • Instructors • Qualified instructors. We frequently lose instructors • Trained, certified faculty
Employment Opportunities	• More awareness of local jobs and pathways to get those jobs • Clear pipeline from training to employment (connections with employers)
Equipment	• Equipment • Specialized training equipment and simulators to provide hands on experience outside of the work place • State of the art equipment for manufacturing credentials • Funding for equipment to launch/enhance new or existing programs • Funding to support employer engagement to stay ahead of technological advances that often outpace curriculum advancement and needed updates to training programs and equipment. • Funding for equipment not covered by HEEFT • Funding for equipment • Money for proper training equipment • Funding to expand programs of study such as dental assisting, PT Assistant, OTA, etc. • Continued funding for tuition subsidy • Modern equipment • Equipment necessary in the learning experience • Testing abilities • Equipment
Tuition Support	• More funding for credential based training tuition • Additional grant funding to assist with individuals who may not qualify for WIOA services TBD • Funds to assist students to test for credentials at the end of courses of study • Equipment

	• Additional non-credit financial aid • Additional Tuition Assistance that will last throughout the entire fiscal year. • Additional Fast Forward Funds (Workforce Credential Grant) • Greater access to scholarship funds • Cash incentives for students to able to use 529 funds or other tax credits if they earn certificates or credentials and get jobs earning a certain amount, create jobs or invest in a business • Funding for tuition for secondary level students who desire dual enrollment in community college courses and could earn credentials to hold at the time of high school graduation but localities have no money and Pell grants cannot be awarded to those who are not high school graduates. • Resources to provide a great number of students with financial assistance. • Funding to offset tuition costs
Employers	• Better info on industry needs • A better focus on business needs and not academia • Relationships with companies • Many of the questions in this survey assumed there was an answer. And, for example, if there were five top "in demand" credentials, the actual demand would vary wildly. That an employer might hire a graduate from a manufacturing course with a NIMS credential is true, but that doesn't mean the credential is actually in demand. Skill sets are in demand in most cases, not a credential. There are some notable exceptions in my area; namely, RN and CDL credentials. The reason is those credentials are also licenses required for employment. That is a different level of "in demand." I don't share the aforementioned information to criticize or belittle, but to explain that the basic question of what credentials the public or private workforce system believes are in demand is a loaded and complex question, not merely a question of rank. The VCCS central office has operated on the assumption in recent years that economic development (and college enrollment) depends on the attainment of industry credentials. That's an oversimplification and will require employers to accept that supposition. Right now, except for licenses required for employment, many (if not most) employers simply target a desired skill-set, that may or may not be fully reflected in a credential. CNA is an example. Your comment above regarding "high demand programs" is more important than what industry-recognized credentials are "in demand." This may seem a small difference, but it isn't. What resources can help discern industry required skill sets? Public LMI sources like VEC and BLS, and private LMI systems like EMSI or Burning Glass are a good start. What might help most is a sufficient sample of industry clusters that would share the required skill sets for given employee positions and ask the industry representatives which of those skill sets they would like the colleges to address. Input from one or two companies (unless they are huge or they form the backbone of a region's economy) are often not sufficient to determine what skills are truly in-demand. In this regard, robust regional chambers of commerce might assist colleges in organizing responses to this question by industry cluster, understanding that sample size is important. • More awareness of the need

	• Proprietary LMI databases • Industry Certification Association Partnerships, Business Partnerships Deeper Relationships with public schools • Ongoing dialog with industry
Curriculum/ Policy/Other	• Less emphasis on 4-year degrees • Projecting future demand is futile. We need community college systems to QUICKLY provide market driven on-demand certificates based on local needs • Credit for prior learning • A standardized catalog between college-i.e. a Machinist program at one college looks the same as another (same course names) • Marketing campaign to communicate the need for stackable credentials • Curriculum • I don't think it's a lack of resources from the community colleges in our region. The biggest problem is finding employees who are dedicated to the job and are willing to work. Most of the employers in the county are willing to teach their new hires, but they often find that they aren't able to retain an employee long enough to teach them the job. I would like to see more emphasis on workplace skills, but that needs to happen much sooner than the community college level. • 1. Interest and willingness to serve as an Approved Training Provider for the Workforce Innovation and Opportunity Act (WIOA) training funding, administered by the local workforce development board. (Serving as an Approved Training Provider provides access to Federal WIOA training funds for jobseekers). 2. Interest and willingness to serve as a training provider for WIOA Incumbent Worker Training projects, in collaboration with private sector employers and the local workforce development board. Funding for Incumbent Worker Training projects are shared between the employer and the local workforce development board. • Workforce training legislative reform that eliminate training through other organizations other than community colleges • Leadership that requires a response time at the speed of business (when responding to local employer needs). Less bureaucracy-allow local community colleges more autonomy to deal with local issues • Curriculum • NCCER curriculum

Appendix L

Raw data. How VCCS can better serve

Survey question #12. How can administrators of the Virginia Community College System better serve individuals and employers with development of a highly skilled and credentialed workforce?	
Credentials/Training	- Stop the Virginia certification and start using the National Work Ready - Offer the best welding and manufacturing credentials and promote them well to the public. Sell in job openings and current salaries for those who have credentials to better educate the public. Focus more on trader certs - Work with state agencies to endorse workforce credentials for their employees and recognize the Virginia Community Colleges as the professional devilment arm of the state - Make it a true focus of and primary job of the Community College - Work with existing businesses and prospective businesses to develop individualized trainings - VCCS needs to really listen to employers about what they need and then deliver it. Currently, many just nod, pull something off the shelf and assume it will suffice. Employers need SHORT-TERM, accessible, on-demand training. Traditional semesters and two-year degrees do not meet employers' needs in most cases. Community colleges should fill their role as trainers and leave the planning and development up to the Workforce Boards whose role it is - Service could be better if employers were more transparent about their needs. They also indicate, at times, a need for training but then, later on, change their mind making it frustrating to help them. Community colleges are laser-focused on helping employers in their immediate service area only. This happens when demand for a credential or training is sufficient to cover costs. Some credentials are needed by only a few companies in a particular service area for a few credentialed individuals in a year, making it difficult for the college to create and sustain a program to serve that need. However, taken collectively across the state, the demand would be greater and a program could be created and sustained. Currently, we (the VCCS) do a poor job of creating such programs that could be shared. An example of this would be soldering or BICSI training.

	- Forget about what credentials we think are "in-demand." Forget about convincing businesses regarding what credentials they should want in a workforce and start asking about skill-sets. Credentialing, such as badges or certificates should follow the identification of in-demand skill-sets, not the other way around. A highly skilled workforce is what employers want and need, not necessarily a highly credentialed workforce. It is nice and easy when a college can learn what credentials they can target, but that doesn't necessarily address the underlying issue and doesn't make a college relevant. Please remember, many if not most employers couldn't care less about an industry credential, unless it is a bona fide requirement for employment like the RN and CDL licenses, or unless they are already convinced that credential holders exactly reflect what they need in an employee. In the latter case, employers across the state might be surveyed as to what industry credentials they think are most relevant and most in-demand per their unique hiring requirements. - Change the CRC certification to the NCRC throughout Virginia. - Most of our businesses are very small and personnel skills are lacking. More Human Resources support would help our business owners. Those who can grow don't want to or like to deal with personnel issues. - They need to provide specialized training programs to smaller groups – With the understanding that they may not achieve a favorable economy of scale. Provide training on a smaller scale. - We have not yet landed a large manufacturer or logistics center. Once we do, we will rely on the Community Colleges to train the workforce with automation and other manufacturing/logistics needs. - They can work more closely with the school systems to develop educational pathways. Middle schools should focus on workplace readiness and soft skills. High schools and community colleges can jointly provide industry-recognized credentials. They should also involve local business leaders to develop curriculum. - Place more value on credentialing that degreed programs. - Provide unbiased support for realistic curriculum suggestions to meet changing needs and demands as new and different workforce opportunities emerge. In other words, be adaptable to change. - Don't duplicate programs at neighboring schools.

	• Work more closely with all WIOA partners and build career pathways with high schools.
Funding	• Continue to provide the support and resources as they have done in the past. • Funding • Continue to lobby legislators for enhanced funding for credentialing programs. Continue to enable colleges to share programs and resources • VCCS should continue to press the General Assembly for more funding to support Virginia's New Economy Workforce Credential Grant program • More flexibility with funding. Less competitive grants – spread the funding throughout that system • Make sure rural areas have access to the instructors and equipment necessary for the training. • Establish funding priorities based on the needs of the workforce. Provide tax credits to businesses that provide training dollars for potential new employees who are currently unemployed or underemployed. Analyze the actual cost of each program of study and future earning potential, and align tuition with the short term (less than 5 years) earning potential of the student. • Enhanced support for financial aid. • Leverage more resources. • Allow for funding for testing – not just the teaching. Testing can be prohibitively expensive for students.
Policy	• Follow the NC model, and use free customized training as a recruitment tool • Ask federal government to change how the money can be spent. The current low/med requirement is archaic and actually stopping workforce advancement in the United States. Millions are being wasted. • Stop focusing on academic terms and requirements and focus on business friendly language and needs. Work better with other local workforce providers to ensure that the workforce system is fluid (WIBS, state agencies, etc.) • 1. VCCS officials can expand the current 40% funding formula requirement for the WIOA Adult and Dislocated Worker Programs to allow for case management costs of the local workforce development board to be counted in the 40% expenditure calculation. This additional flexibility will allow local One Stop Operators more resources to invest in additional

	case management staff, to better serve jobseekers and employers. 2. VCCS officials can utilize annual WIOA Governor's Reserve Funds and allocate to local workforce areas for targeted expansion of specific training and job placement services. Expanded services could be focused on specific populations to be served or specific training programs in demand by industry. • Continue to lobby legislators for enhanced funding for credentialing programs. Continue to enable colleges to share programs and resources • Administrators are creating additional bureaucracies and policies that hand tie us in terms of offering flexible workforce training solutions. We want to be held accountable and have a proven record of success if needed by state legislators. • Allow more flexibility on pricing so we have the opportunity to adapt to pricing changes and new models as the type of students we are seeing is changing (they need more assistance) • Implementing needs in previous question response.
Employers	• Continued development of relationships with employers to create training/employment pipelines • Do more polling of local employers. Work more closely with local economic developers • Go directly to individual employers to sell the ACT. Employers, especially, small and middle, are focused on work and production and generally will not seek out this type of assistance. They will not even attend a group or regional meeting about government "help". Listen to the major employers in your community and meet their needs • Short-term training meets a specific purpose, but it does not always prepare an individual with the critical thinking skills and work ethic needed to do a job. We need to listen to what the employees are telling us. Most in this region are not interested in credentials. They want individuals who have the ability to adapt, learn on the job and the willingness to show up and work • Stay better connected with the employer needs. Connection with Economic Development • More communication on what's needed by employers to encourage young people to seek credentials • They should also involve local business leaders to develop curriculum. • Proactively meet regularly with company leaders to develop a network of need and to help guide development of support for companies in the realm of workforce and credentialing.

	- Continue to bring together employers with high demand and colleges in that service region - Provide opportunities for input on needs which can change year to year. - I believe the VCCS tries their best, but if employers don't identify their needs in a clearer way, it is only so much VCCS can do. - Work directly with the businesses and industries to identify training needs - Collaborate on systematic outreach (i.e. all three community colleges in Southern Virginia, design and deploy a system of outreach to employers (annual surveys, annual focus groups, etc.). Communicate that schedule with local and regional economic developers to ensure their support. Present benchmark information from year-to-year that demonstrates responsiveness and success in preparing the workforce. - Be more in touch with employers to learn the skill sets needed. - Work cooperatively with existing business to assess needs. - Same as previous answer but avoid typical educational jargon and make any program truly streamlined to the employers needs. - Stay current with emerging industry and occupational trends. Engage with local/regional employers to better assess what the demands on skill will be in 5, 10 and 15 years. - Connect with the employers. - Constantly staying on the front line of what is needed – not today – but tomorrow. It's not sufficient to keep up with today's trend lines.
Communications/Marketing	- Providing tools and funding for locally driven advertisement of jobs and pathway to get - Advocacy and awareness of credentials to the influencers- K12, guidance counselors, teachers, and parents – they are clueless about credentials and the are the best influences of the future workforce! Redefine what "going to college" means! It can/should mean obtaining a credential, NOT just a degree - Better marketing of credential career options, pay and benefits. Better advising on career goals - Communicate the "success stories" of recently credentialed workers - The VCCS can send out information to employers about credentials, credential growth and demand, the stats on employee retention and progression who have credentials, funding for training, creating skilled workforce pipelines.

	- Continued recruitment and education of students throughout the system - Switch from facilitators to communicators (promote credential opportunities via statewide marketing – ie help create supply not focus on developing education solutions) - Enhanced messaging for recruitment strategies that appeal to the current student population. - Better advertise their education and training opportunities to adults.
General Comments	- I think we are doing a good job currently. - Current service is excellent - Combine employer advisory councils with all workforce partners as much as possible to avoid asking employers to serve on multiple councils. - They are typically doing a great job with varying levels of financial and community support. - Ability to respond at the speed of business and not at the speed of bureaucracy. - Better quantify the need for their participation (is their a need for their inclusion and where). Better define what their interaction should be. - Not all geographic areas of the Commonwealth have the same levels of interest in areas of study. The system should be cognizant of and acknowledge recognition of problem areas, and/or differences of needs in each of the geographic areas in which community colleges are located.

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VITA
DEBRA KAY SMILEY
dsmil002@odu.edu

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EDUCATION

Ph.D. Community College Leadership, Old Dominion University, December 2018
M.S. Administration, Central Michigan University, May 2001
B.S. Business Administration, Longwood College, May 1982

EMPLOYMENT

December 2009 to present:
SOUTHSIDE VIRGINIA COMMUNITY COLLEGE
Director of Workforce Development and Continuing Education

August 2004 to November 2009
SOUTHSIDE VIRGINIA COMMUNITY COLLEGE
Coordinator, Off Campus Instruction

January 2000 to 2004:
SOUTHSIDE VIRGINIA COMMUNITY COLLEGE
Human Resource Manager I and Adjunct Faculty

August 1997 to January 2000
SOUTHSIDE VIRGINI ACOMMUNITY COLLEGE
Personnel Analyst

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July 1989 to August 1997
VIRGINIA DEPARTMENT OF HEALTH
Office Services Supervisor Senior

November 1986 to June 1989
NARRICOT INDUSTRIES
Personnel Manager

COMMUNITY

January 2008 to 2016
Elected member of Mecklenburg County School Board; District #6
Vice Chair, 2016

January 2008 to December 2012
Board member, Governor's School of Southside Virginia

Delta Sigma Pi
Alumni and original charter member for Kappa Nu Chapter business fraternity at Longwood College

<u>CERTIFICATIONS HELD</u>
VCO—Virginia Contract Officer
Certified by Commonwealth of Virginia Division of General Services

PHR—Professional in Human Resources. Certified by Society of Human Resource Management

ACT WorkKeys Profiler --ACT