

**Understanding Perceptions of Post-Secondary Education Among Rural Manufacturing
Business Managers**

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This study explored the ways post-secondary education intertwines with manufacturing in northwestern Pennsylvania with a particular focus on the perspectives of rural manufacturing business managers. The purpose of the study was to learn what skills and education the rural manufacturing business professionals believed their employees needed, how the professionals communicated their business and employee challenges with post-secondary educational leaders, and how their perceptions of post-secondary education changed during their tenure as rural manufacturing managers. This study provided valuable insight into the personal and technical skills employers seek when hiring new employees.

Eight manufacturing business professionals who led businesses in two rural northwestern Pennsylvania counties participated in this study. Following Bailly's (2008) model as described by Cai (2012), this study found that the participants used employee performance and skillset to impact their decisions for future hiring. The findings of this study suggest that skills are more important to the rural manufacturing business professionals than post-secondary degrees. In addition, this study found a lack of communication between rural manufacturing business professionals and post-secondary education leaders. These professionals addressed the need for skills-training programs to ensure employees were trained to meet the local workforce needs. Also, this study found a need for short-term employee development trainings to support operations, skills development, and training on new machines at the local businesses. Finally, post-secondary

institutions did not include local manufacturing business managers on institutional advisory boards; therefore, the manufacturing leadership skills and knowledge of the manufacturing industry were not incorporated into post-secondary programs.

Stemming from these findings, this study offers two important implications. First, there needs to be communication between rural manufacturing business professionals and post-secondary educators. This will allow for dialogue about workforce needs. Secondly, post-secondary education should consider ways to provide personalized trainings to local businesses to meet its training needs.

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Preface

First, I would like to thank my committee members, Dr. Stephanie Urchick, Dr. Jerry Longo, and my advisor, Dr. Linda DeAngelo, for their support and guidance in this dissertation. Your feedback and encouragement were greatly appreciated. Selecting committee members was not an easy task, but I am so glad you agreed my research was worthwhile and provided the guidance to publish the findings.

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1.0 Introduction

It could be argued that some rural communities lack educated workers not only because of the remote location but also because education is not valued at the same level as many urban areas where there are more workers competing for the same position. A 1996 study showed that 12% of production jobs were located in rural areas, which was a 3% increase from the year prior; however, rural employers are still more likely to find a high school graduate than a college graduate willing to work in the rural area (Gibbs et al., 1998).

In general, rural residents achieve lower educational levels and are less likely to attend a post-secondary institution (Bauch, 2001; Gibbs et al., 1998). People in rural areas have had lower high school graduation rates and educational attainment for decades (Bauch, 2001). Overall, rural jobs have a lower educational requirement (Swaim, 1995). This information reveals that rural residents are not as educated as their urban counterparts, which has significant implications for business professionals in rural areas. For example, how do business professionals interpret the education of their employees and the impact of post-secondary education training and completion on business development and expansion? Do rural business managers expect their employees to have a degree to work in manufacturing, or is that not a concern for employers? Although the businesses these business managers represent may or may not require a post-secondary education credential, they must have some perception of post-secondary education, which can encourage or discourage others to enroll in continuing education.

The lack of employment options is not a concern in rural areas as long as there are jobs for citizens to earn money and provide for themselves and their families (Bauch, 2001). One fear of parents is if there will be jobs in the future for children of workers to stay close to home and work

near family in a community where they are familiar with the environment. Workers in rural areas earn less and have lower benefits than urban workers; however, that does not affect the worker's desire to remain rural and work with their friends and family in a small community (Bauch, 2001). Rural citizens want to stay near where they grew up and in a place with which they are familiar.

This study aimed to ascertain how manufacturing business professionals in rural northwestern Pennsylvania understood and perceived post-secondary education. For the purposes of this study, post-secondary education included training, certifications, and degrees earned after high school. Furthermore, the rural business managers were those who hired employees and influenced others in a community. Perception in this study was the business professional's understanding and interpretation of post-secondary education within their business. This included how post-secondary education can play a role in recruiting and retaining successful workers and their responsibilities and expectations of educated employees. In addition, it also included how the business manager believed training and education could benefit or hinder success within the workplace. The data collected and examined through this study can inform others whether rural areas need post-secondary education options. This study also provides an understanding of how post-secondary education is valued in the rural area and how that can influence pursuit of continuing education. Crain (2018) noted that many rural residents do not see the value of a college degree, and the jobs within those communities do not require a college degree. His report was based on a 2017 *NBC News* and *Wall Street Journal* poll that revealed only 33% of rural citizens considered a bachelor degree to be valuable. Therefore, rural business professionals may be among the third of rural residents who consider a post-secondary education degree necessary for success or have mixed perceptions on the value of post-secondary education and the degree for themselves, their family members, and their employees.

1.1 Problem Area

The perceptions of employers and business professionals change with the business needs, traditions, and other factors regarding how education qualifies employees and how they should be utilized in the workplace (Cai, 2012). Galston and Baehler (1995) noted that workplaces needed options to train and educate their employees in rural areas. Local development agencies and post-secondary educational institutions are sources that offer these types of services and techniques to train a skilled workforce and aid small business. However, Carnevale and Smith (2013) noted that, as changes increase in the workplace, there is less time to train current employees who are not already educated in the field or trade. Therefore, having educated employees at the outset gives the employer the ability to match skills and competencies learned in trade or post-secondary education schools to meet the changing job requirements. There is no single finding in the literature regarding how employers and business professionals see and utilize post-secondary education; it depends on multiple factors in the workplace, the opportunities with employees, and education available in the rural area.

In regards to the present study, manufacturing is one of the top employment sectors in northwestern Pennsylvania; however, Miller and NC3T (2015) noted that there was a negative perception of manufacturing in the area. The study noted, “the idea persists among parents and students that they [students] must pursue a four-year college degree in order to be successful” (Miller & NC3T, 2015, p. 57). It is possible that if residents in the community have this perception, the manufacturing business managers who employ parents and students will hold similar views.

Many times the cost of post-secondary education is a shared burden, because it affects the business or employer, the employee, and the government, all of which contribute to post-secondary funding. Rosenfeld (1992) noted that employers might not adequately fund education and training

because it can lead to many challenges along the way. One obstacle for manufacturing employers is that it is hard to quantify the need to educate employees beyond the minimal operational needs. Employees need certain skills and knowledge to function in their role within the business but do not need undue knowledge and skills that could muddy their understanding or be irrelevant to daily operations. Another factor is, if an employer invests in educating the employees, the employer may or may not reap the benefits of their skills and knowledge, because the employees could move on to another role within the company or leave the business for increased pay or a better role. Additionally, if there is a competitor in the area, it is easier for one business to recruit skilled and educated workers from the neighboring business than to pay for educating their own employees (Rosenfeld, 1992). Therefore, when employers are investing in educating their employees, there may be a policy or mutual understanding for a return on the employer's investment. It could mean time away from work or money that is invested for education or skill development with the understanding that the employees will give back to their employers and share their knowledge with other workers.

1.2 Problem of Practice

There are multiple perspectives on how education, skills, and competencies fit into the workforce. The perceptions of employers and business managers change with the business needs, traditions, and other factors as to what education and qualifications employees need and how they should be used in the workplace (Cai, 2012). Perceptions about the value of post-secondary education could be based on experiences, personal education level, belief or disbelief in the education system, and many other factors.

As of the 2010 United States Census, 97% of the country's geography was classified as rural. While this is a large percentage, only 19.3% of the population lived in a rural area (Schaidle, 2018). The United States Census Bureau defines rural areas as communities with less than 1,000 inhabitants per square mile (Herzog & Pitman, 1995). This study was conducted in the 10 county area of northwestern Pennsylvania where all but one county, Erie, are considered rural (Center for Rural Pennsylvania, 2014). This region has limited resources and employment opportunities because of its remote location and narrow workforce. The skills and background of employees and the access to training through post-secondary education narrows employer expectations of employees. Northwestern Pennsylvania includes Butler, Clarion, Crawford, Erie, Forest, Jefferson, Lawrence, Mercer, Venango, and Warren counties.

Manufacturing is one of the top industries in northwestern Pennsylvania (Miller & NC3T, 2015). According to a May 2019 article in *The Meadville Tribune*, manufacturing jobs have remained unchanged recently with the manufacturing sector comprising 22% of the jobs in Crawford County. That figure is more than double the state percentage and nearly three times the national percentage of manufacturing-related jobs (Gushard, 2019). Within Crawford County, which is close to the center of this region, three of the top 10 employment sectors in 2018 were metal, plastic, and machine shop manufacturing (Center for Workforce Information and Analysis, 2019). Because this county has a significant manufacturing industry, the study focused specifically on this county and the others surrounding it to understand how post-secondary education is perceived by employers who are building their businesses and hiring manufacturing employees.

Galston and Baehler (1995) noted that rural areas need education at all levels to remain viable by relieving poverty and retaining younger citizens:

[Rural areas need] elementary school[s] to make these communities more attractive places for adults to live and raise their families (and to improve the cognitive abilities of future work force); high school[s] to ensure that students are receiving the appropriate type of education to prepare them for local jobs or for college; community college[s] to raise vocational skills; and 4-year college and universit[ies] to generate a homegrown professional work force. (p. 106)

Having access to higher levels of education is essential, because the availability of post-secondary education in the area could impact how residents view post-secondary education. If the option is available for community members to gain further knowledge and advance their skillset, they may be motivated to expand their education. When a supervisor or manager encourages employees to continue their education based on their personal belief in post-secondary education, the employee may be more likely to pursue the opportunity.

Therefore, this study sought to understand how rural manufacturing business professionals perceived post-secondary education. While there is limited literature about rural education and rural business professionals, some underlying themes emerged that impact perception and what may be viewed when a rural manufacturing business manager is looking at education and skills for employees. While it is concerning that there is limited information on the perspectives and needs of rural business professionals, there is an understanding that a large percentage of the United States is considered rural and that the rural voice needs to be understood. Therefore, the goal of this study was to help identify factors that influence the business professionals' perceptions of post-secondary education and how those perceptions developed and changed over time.

1.3 Overview of the Study

This study took place within northwestern Pennsylvania where manufacturing is one of the largest employment sectors. At the time of the study, all the participants owned or were employed as a manager in a business with 25-75 employees located within 30 miles of a post-secondary education institution. The study did not require a specific educational achievement by the business manager to participate nor did it require an affiliation with any specific institution or institution type.

The perceptions of rural business professionals were learned through recollections, stories, and discussions. The goal of this study was to identify employers' perceptions of post-secondary education and how continuing education was viewed as a need or challenge for rural manufacturing business professionals. The intention of this study was not to reveal shortfalls in educational offerings but to understand how post-secondary education was viewed in the manufacturing sector and if post-secondary education impacted rural manufacturing in northwestern Pennsylvania. Business professionals' reflections were both conscious and unconscious and based on their beliefs, personal education level, and how they utilized post-secondary education in their business or to recruit employees. The following questions guided the study:

What role does post-secondary education play in rural manufacturing?

How do rural manufacturing professionals and businesses work with post-secondary education institutions?

How has the rural manufacturing business professionals' perception of post-secondary education changed or evolved over their lifetime?

1.4 Significance of the Study

Budge (2006) noted that, while every rural area has its own unique community and set of needs, there are six challenges that are visible amongst all of them. Those challenges include: (a) isolation and low populations, (b) interdependence between education and the community, (c) lived experiences and oppression, (d) younger people leaving the area for some reason or another, (e) community members' attachment to their location, and (f) clash about the purpose of education. These concerns impact business operations and success; therefore, understanding how business professionals' and owners' beliefs about overcoming these challenges is crucial to retaining employees. Furthermore, understanding the changing needs of rural employers and their expectations of employees specific to education provides a picture of how post-secondary education is perceived and how it can impact this business sector.

Post-secondary education institutions nationwide must understand the educational needs of rural businesses and the employees who will work at these rural businesses to ensure the desired workforce skills and knowledge are available. However, to ensure that this study centered on rural manufacturing professionals who had access to post-secondary education, the manufacturing employers included in this study were located within 30 miles of a post-secondary education institution. The way to understand the business needs and what business managers see as quality education and employability is to know how they perceive post-secondary education and how employees can best be prepared for the workforce.

2.0 Literature Review

While there is little research on rural post-secondary education, there is even less literature that focuses on manufacturing employers' perceptions of post-secondary education. The literature reviewed in this chapter focuses, for the most part, on employer beliefs about education and how the business field views the impact of technology in the workforce, leadership, partnerships with post-secondary education, competencies and skills of college graduates, and on-the-job training of employees.

2.1 General Employer Beliefs

In general, employers use the words, skill and education, as interchangeable concepts. Employees and employers alike believe that what is learned in school is skill and education (Alic, 2018). However, even though a concept is discussed in a classroom does not ensure that skill or knowledge is understood by the student; the student must take time to understand the background behind the concept, be able to explain it, and demonstrate that they can perform the task associated with the skill for this classroom knowledge to become an acquired skillset. The tasks expected of employees have not changed as much as the expectation for understanding the business, the work, and the need for education (Stark & Poppler, 2016)

Many employers believe that the more schooling an individual has, the higher the wage expectation (Alic, 2018). As their education and experience levels increase, employees often expect to earn more. It is logical that worker productivity would increase as employees become

more educated because of the knowledge and skills developed through schooling (Boring, 2014). It follows then that as an employee's productivity and knowledge increases, so should the employee's wage, which in turn impacts the financial obligations of the business. However, employers also want to ascertain that the employees actually possess the skills and the commitment to complete their work before they offer an increase in salary.

Many employers in the United States are looking for employees who have earned a bachelor's degree and indicate that in job postings (Stark & Poppler, 2016). However, employers have been shown to look to an applicant who has not earned a degree but who possesses the skillset required to fill the role (Ahmad, 2017). Ferns (2019) noted that, while 31% of employers require a bachelor degree when advertising a position, nearly 70% of employers will consider a qualified candidate without the degree. This means that skilled job-seekers without a degree have the potential to be hired due to experience and work history.

Some employers rely more on education credentials than references, because education occurs in a supervised setting whereas skills learned and demonstrated in a reference are not visualized and evaluated constantly or consistently (Alic, 2018). In a survey conducted by *The Chronicle of Higher Education* and the American Public Media's *Marketplace* (2012), it was noted that more value was placed on the four-year degree today than five years ago by employers. Manufacturing employers in the survey suggested, overall, that increased competition has led them to value employees with post-secondary degrees more so than they did five years prior. That study also found that manufacturing business professionals noted that they were looking for the exceptional candidate for each position. The study reported that manufacturing employers hired the best candidate 32% of the time regardless of the applicant's education level. In addition, if a candidate did not have the degree required in the job posting but was an outstanding candidate

who had the skills and knowledge for the job, the manufacturer hired that candidate 43% of the time. Finally, 25% of the time, the manufacturing business hired only the candidate with the education requirement for the job. Another interesting point in the 2012 study was that the manufacturing sector desired applicants from public institutions more than private, online, and liberal arts institutions. The top three types of institutions the manufacturing sector looked to were: flagship public colleges, technical colleges, and regional campuses of public institutions. In addition, there was a desire to hire applicants from institutions the business professional knew over a degree earned from a post-secondary institution unfamiliar to the hiring manager.

However, other employers do not view a degree as relevant as work experience, because post-secondary education institutions are not equipping graduates to be ready for the workforce. Some argue that general employability skills are not as visible in graduates (Ferns, 2019). Because of the lack of basic work skills, the United States is seeing a push for more business and industry partnerships with post-secondary institutions to provide hands-on training to learn skills of the trade and employability skills along with the degree. Employers are looking for employees who bring honesty, integrity, interpersonal skills, professionalism, flexibility, analytical thinking, adaptability, and the ability to create solutions to the business (Ahmad, 2017). The 2012 survey conducted by *The Chronicle of Higher Education* and American Public Media's *Marketplace* noted that, in the manufacturing sector, 24% of the hiring decision was based on academic credentials and 37% was based on experience, which leaves over one-third of the hiring decision neutral and potentially impacted by these work skills. A 2019 study on the skills gap noted that 90% of employers would hire an applicant who can verify their skills and knowledge over a college degree (Wiley Education Services & Future Workplace, 2019). That same study also noted that

55% of employers would offer employment to applicants who have not completed their college degree.

2.2 Unintended Factors

2.2.1 Technology

As technology expands, there is a growing need for more skilled and independent workers. These workers must know how the business operates and how they can best serve the industry. In general, workers need to be more technologically inclined and be able to adapt to the changing work environment and operations based on the switch from assembly lines to more computer and skill-based operations (Carnevale & Smith, 2013). There is a growing number of machines within the overall manufacturing sector that utilize computers or software within them that require the employee to know how the machine functions and how to adjust the machine's operations through the technology provided. It may be selecting options on a screen or could be how to slow or speed up operations of the machine on a computer; regardless, technology is increasing in manufacturing operations and employees must adapt to the increase (Carnevale & Smith, 2013).

Access to education for training impacts the opportunity to expand business with technology. Rural business employers note that access to training, equipment suppliers, and skilled professionals and laborers impact their prospect to adjust as new technology is developed (Gibbs et al., 1998). While this has not been a hindrance to all manufacturers, the cost of adapting to technology is more visible in rural areas. The cost is in the need to train and educate employees, which means time away from the office to learn the new equipment or software as well as the cost

for the travel and training. In addition, there is limited access to local experts to install and service advanced machinery in rural areas, which causes longer periods of down time for the employees and business productivity when the business is not fully staffed or equipment is not properly working.

Technical competencies are a common concern of all employers (Bailly, 2008). Employers and business managers want to be sure that employees can adapt to changing needs within the workplace and that technology will not be pushed aside and stall progress. Gibbs et al. (1998) noted that the greatest disparities between rural manufacturers who are high adopters and low adopters with technology and skills are that the high adopters report more major problems with finding employees who possess problem solving skills, technical skills, computer skills, and basic math, while low adopters experience more problems finding reliable workers with a positive work attitude. The high adapting businesses are changing with the trends but are not able to recruit employees with the skillset to meet these changes. Without these skillsets, future business development and adaptation to new technology will not be possible for the rural business.

2.2.2 Leadership

All workers, irrespective of geography, must understand the business, its mission, and its plan in order for the business and the employee to succeed. This starts with the business supervisor expressing the importance of why the business is located where it is, how it started, and what lies ahead. By knowing and understanding this information, the workers recognize what is expected of them in the business, know how to interact with other employees and their customers, and can prepare to serve as a role model and peer leader in the business. The business managers set the tone for the operation and business success. It is their portrayal of leadership and communication

of expectations that leads the employees to know how to act and stimulate the employees to complete the tasks associated with the job.

In addition, there needs to be a mutual respect between management, supervisors, and workers so all are heard and feel they can openly discuss concerns and address the needs and problems of the business. One cautionary example occurred when a manufacturing supervisor did not understand the equipment and refused to listen to the worker. A particular machine was inoperable, but the supervisor held back the employees, who knew what needed to be fixed and how to fix the machine, from ordering parts. Although the supervisor was more highly educated, he did not understand the machine, degraded the employees and did not respect their knowledge, and ultimately set back production (Rosenfeld, 1992). This is one reason why Rosenfeld (1992) noted that that managers need to also know the daily manufacturing operations so they, too, understand how the business succeeds with production, assembly, and distribution to respect what the employee, at any education level, deals with on a daily basis to complete the job. Leadership in manufacturing entails, for example, the ability to understand why the machine is not working as well as how it operates.

2.2.3 Partnerships and Connection to the Community

Another theme that emerged from the literature was when there is a post-secondary institution near the rural business, the business and institution need to connect to meet the educational needs of the area businesses. By offering courses that meet business needs within the region, rural institutions can work with community developers to attract new businesses to the region and educate residents to meet the skill and education requirements of employers (Kasper, 2003; Miller & Tuttle, 2006). When employees can earn credentials and skills locally, businesses

and industries are more apt to stay in the local area, because they can be assured their employees know what is needed to complete the tasks required and encourage them to stay local (Miller & Tuttle, 2006; Schafft, 2016). Partnerships between post-secondary education institutions, industry, and communities could lead to economic stability for the business, community, and the institution when citizens are employed after completing coursework locally. In fact, many institutions have blended coursework to ensure the local workforce needs are met by increasing short-term trainings and skill development courses in addition to developing degree programs (Kasper, 2003). This allows for a quicker return on investment for the rural worker and the employer who can keep operations intact while the employee is learning the next step of the business development and changing demands of the industry.

Knowing the community is just as important as education in a rural setting. Post-secondary institutions must understand what is needed in the workforce and can learn this by talking with economic development personnel and business and industry professionals as well as understanding the community interests. From there, they can adapt course offerings and other workforce development programs. One example of adapting to the workforce needs through environmental scanning is when employees who have undergraduate degrees still seek education from the local rural institution once employed in the workforce. Rural institutions can adapt to those needs by offering new technical trade skills and technology training so that employees can expand their understanding to advance themselves in the field. Employees must adapt by learning trade skills as well as technical skills to advance in the workforce even after earning a college degree. While continuing to advance their skills, they are not only building their knowledge, they are marketing themselves to advance within the workforce (Miller & Tuttle, 2006). Workforce training

opportunities in rural areas help attract and retain employers, which assists with economic development in the community.

The rural business can also become a curricular resource for institutions when the business professional supports post-secondary education; however, there is little research on the number of rural institutions that engage in this process (Bauch, 2001). Bauch (2001) found that rural communities needed to collaborate to best serve their citizens. These institutions work with their regional businesses and agencies to offer programs that support the students and prepare them for the workforce. The areas reported in Bauch's (2001) research as being effective for this work are: (a) integrating a sense of belonging and involvement in the community within the education system and (b) utilizing community businesses as laboratories where skills can be learned. This adds practical value to post-secondary education since the student learns hands-on skills at the business site to prepare them for a future career in that industry. In this model, students learn trades and skills while the community gains new perspectives from the students and mentors the next generation of skilled tradespeople (Bauch, 2001). In addition, building community interaction can foster discussions for networking in rural areas. The soft skills of interpersonal communication are developed. Valadez and Killacky (1995) referenced the Commission on Small/Rural Community College's study in 1991 and noted that, by establishing partnerships within the community, rural areas were able to address social issues and provide workforce training to employees. While their work focused mainly on rural communities in the southern United States, the conclusion was that, in the past, manufacturing and labor jobs did not need post-secondary education. However, moving forward, businesses within these sectors and other employers in general will need to work with post-secondary institutions to develop partnerships that support the workforce needs. This support

can span multiple aspects of educational services and economic support for the businesses and community.

Rosenfeld (1992) examined rural manufacturing and the changes that impact economic development and human resources. He noted three lenses – the worker, the management, and the education facility –that all have differing perceptions on education and the rural workplace. The view each role has contributes to perceptions such as the workers having a lack of interest in learning new ideas, keeping up with technology, and wanting to advance their community overall with more jobs through company expansion. It may also be knowing the community resources as a manager to seek post-secondary education graduates in the region who possess the skills and have the desire to live in the rural area. Based on their rural locations, Rosenfeld argued that, without ties to the area or region, it can be challenging for manufacturers to recruit and retain skilled and educated workers, because those workers are looking for public education and continuing education options for their families and themselves along with a competitive wage for their education and skillset (Rosenfeld, 1992). This then adds to the need for access to post-secondary education for the workers to continue their training. There is also a need for the regional employers and business professionals to communicate with the education system about the skills and training businesses need to provide institutions such as curriculum based on the company and employee needs.

Relationships between post-secondary education institutions and rural development actors can be summarized by the goal of empowering rural communities to be self-sustainable (Wang, 2015). Knowing the needs of the businesses in the area assists with developing trainings and skill development to educate citizens for the workforce businesses need. Collaborations and partnerships are a way to bring more up-to-date programs to rural areas and produce workers who

have adequate knowledge (Rosenfeld, 1992). Post-secondary education is a way to build knowledge and skills that are needed in the community to expand opportunities for economic and business development. By doing so, jobs are created and retained, and workers are able to sustain or grow their income over the course of their careers to provide for themselves and their families.

2.3 Intended Factors

2.3.1 Employability – Competencies and Skills

Employability means different things based on the business, industry, skills, and competencies. There is a growing need for general skills in all sectors (Carnevale & Smith, 2013) including communication, manners, reasoning, and basic problem-solving more so than specific academic and vocational skills. With increasing human interactions to respond to the needs and wants of people, workers must know how to approach and develop interpersonal skills and think on their feet when dealing with the public, fellow employees, and their employers. It is best when employees can personalize their communication with the individual they are addressing on the spot rather than generalize.

Many executives agree that there are more than resumes, grades, and test scores that contributes to an individual's employability; however, those are the main factors reviewed when hiring a new employee. Experience and skills seem to be missing in today's general workforce (Busteed & Seymour, 2015), which is why only 11% of overall mid-level executives strongly agree that their business's needs are met by the skills and competencies of college graduates (Busteed & Seymour, 2015). College graduates are not learning basic life and interpersonal skills to utilize

within the workforce. Rather, they are focused on the trade and professional tasks of their field. While employers expect well-rounded and competent employees who have these soft skills, the employers have reported that some college graduates still lack these skills once they are on the job, which detracts from their ability to interact with various generations of co-workers and supervisors who may or may not have a degree (Gibbs et al., 1998).

Two of the competencies Carnevale and Smith (2013) noted for any employee were self-esteem and motivation. Employees must be able to understand the business needs while putting forth the required mental effort to complete the work tasks without losing focus. Moreover, employees at any location and in any sector must have confidence in themselves and respect for themselves to know they are able to complete the required tasks and do so without fumbling with personal or peer pressures to steer them otherwise. Employers expect the workers to be able to remain conscious of the business needs and be motivated to address colleagues and their managers to meet the business goals. The business will not succeed without the workers buying into the goals and focus of the business.

Businesses are looking for employees who have more than basic skills; they are looking for cross-training that carries the basic computer and literacy skills into the manufacturing workforce (Rosenfeld, 1992). Future employees should be leaving college with more than training for an entry-level position and with a broad understanding of employable skills to understand how to relate to others, operate machinery, and follow directions without being monitored or coached the entire day. Employers are expecting post-secondary institutions to help students learn skillsets that will assist them outside of the business operations and with their interpersonal and communication skills. There is an understanding that developing the student as an employee and

person who can function independently and fulfill the tasks before them should be the focus of post-secondary education (Gibbs et al., 1998).

However, the skills gap study also noted that 68% of all employers in the United States still require hard skill verification before hiring an applicant to verify their understanding of the business sector and tasks they may conduct on the job (Wiley Education Services & Future Workplace, 2019). Employers want educated employees to enter the field with an understanding of the skills to fulfill the tasks of the job from the day they start. In the manufacturing sector, this may include specific computer programming or machinery certifications as well as an understanding of how to operate the machines and tools within the business.

2.3.2 On-the-Job Training

Carnevale and Smith (2013) noted that the common trend with employers in general was to offer more on-the-job training to employees with post-secondary education than to employees with a high school diploma or less. However, many rural workers do not have education past high school; therefore, any skills and competencies that are specific to the rural job must come from on-the-job training. Gibbs et al. (1998) reported that 18% of rural employees who dropped out of high school received training at their current job compared to 73% of graduates with post-secondary education who say they received training. Therefore, educated employees are more apt to receive continuing education and training whereas those without a post-secondary education credential are not seen by employers as being worthy or able to obtain on-the-job training. This could be a factor that is influenced by the rural manufacturing business manager's personal educational attainment or their perception of what post-secondary education provides an employee and business.

Employee work experience and internships are seen by some employers in general as carrying more weight in the hiring process than academic qualifications. According to *The Chronical of Higher Education* and American Media's *Marketplace* (2012) survey, the most important credential on an applicant's resume was internship experiences. Internships are the hands-on training that gives the student an opportunity to work with various people and learn skills on-the-job to know more about the tasks and skill requirements to fulfill the role. Employers can utilize interns to share updated knowledge with current employees while testing their skills to know if they would make a good candidate for any open positions within the company after the internship.

Management lacks confidence in rural institutions, because there are fewer resources and less knowledge at smaller, rural schools to provide the training and certification for their businesses. This then requires rural managers to recruit skilled and trained workers from outside of the area to bring training to the business (Rosenfeld, 1992). These outsiders then work in the rural business without the most up-to-date equipment or less skilled workers to advance the business. Some of the reasons business professionals say they need to recruit and employ these skilled workers from outside of the area are because of the lack of confidence in the education systems to provide updated equipment for employees to learn the skills and also because of their lack of trust in the vocation system. In 1990, the Carl D. Perkins Vocational and Applied Technology Education Action was initiated to emphasize academic and occupational skill competencies through on-the-job training to increase the use of technology in rural areas (Rosenfeld, 1992).

2.4 Theoretical Framework

Many variables impact perception, and, because of these many variables, Bailly (2008) developed a theory based on an employer's beliefs and not solely the labor market, human capital, or other signals that impact business. While the thought is that education increases productivity, the human capital theory that Bailly used to develop his theory does not elaborate on the variables that contribute to the overall perception of education (Bailly, 2008; Kulkarni et al., 2015). Bailly's three-part theory is a way to model how unconscious and conscious thoughts influence decisions. This is evidenced in this study by the employer's beliefs and processes based on trial and error of what worked in the past and what is needed currently and in the future (Cai, 2012). Bailly believed that employers evaluate educational credentials based on their perspective of those credentials along with their responsibility to hiring qualified employees. The employer's hiring decision is attributed to the anticipated productivity of the candidate and their education level (Shivoro et al., 2017). Once the employer knows the employee's ability, credentials, and education level, they can determine if the applicant fits the business needs to employ them or move on to another applicant based on their personal beliefs.

There are three stages in Bailly's (2008) model. The first stage describes the development of the employer's beliefs. It looks at how the employer's beliefs are developed before the employer has experience hiring employees with educational backgrounds and centers their recruitment and hiring based on their own beliefs about the applicant.

Stage two of Bailly's (2008) model was used as the focal theoretical framework of this study as it begins after employees are hired, which is simulated in this study because all the participants in this study had been hired or worked with current employees, and impacts the business manager's beliefs. It is during stage two that the beliefs are adjusted based on past

situations and new opportunities for business needs. Each worker's abilities and skillsets assist with developing and altering the employer's beliefs of education as well as the capabilities of the workers with and without post-secondary education (Bailly, 2008). This trial and error process develops the business professional's beliefs through personal recollections and supervision of employees (Mullen, 2014). The employer's perception of the employee's education level and skill influences their future thoughts of how post-secondary education can or should be part of the hiring or promotion of employees. Because each employee's educational history and skill level impacts their beliefs, the continual process evolves until an equilibrium is met where the productivity and expectations are maintained at a constant level. To meet the needs of this study, the performance of the worker was decided by their training and education. The type of institution where the employee earned their degree may also be a factor if that is part of the hiring criteria. Recruitment efforts for future employees may be adjusted through a trial and error process based on these areas during the hiring stage. Figure 1 below demonstrates Bailly's second stage when employer beliefs are influenced by the workers' performance in the recruitment and hiring process.

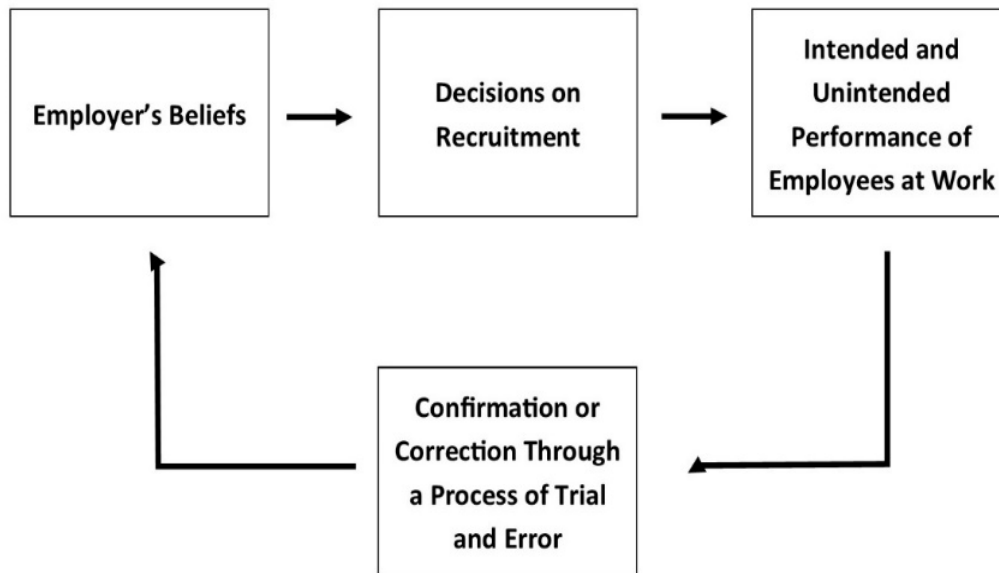


Figure 1 Bailly's (Cai, 2012) Development of an Employer's Belief – Stage II

The third stage of Bailly's (2008) model added the public and private learning process to the belief development. It includes aspects of the first two stages along with private and public learning from the performance outcomes, which means the conclusions are then disseminated privately or publicly, which in turn starts the process again by impacting the employer's beliefs. The public and private learning is based on trial and error and who sees and perceives the decisions that are made through this stage (Cai, 2012).

One limitation of Bailly's model in this framework is that it is based solely on the individual's beliefs; it does not directly take into account any environmental or social aspects of business or education (Cai, 2012). His claim is that decisions are made based on individual beliefs that allow external factors such as the business environment or social needs to limit interaction in the decision-making process of hiring and operating the business (Bailly, 2008). Scott (2008) wrote, "to understand or explain any action, the analysis must take into account not only the

objective conditions, but actor's subjective interpretations of them" (p. 57). This means that rural manufacturing business managers have a variety of processes that impact their beliefs on post-secondary education including productivity of post-secondary educated employees in the past and present, interactions with others who are and are not educated after high school, and what their job requirements are.

This adaptive theory is seen in the ways rural business supervisors change their perspectives in response to the environment around them. Because business professionals have their own identity and beliefs, the idea of adapting through Bailly's (2008) theory can be different for each person based on their personal education level, their business needs, and the availability of post-secondary education. These professionals are adapting to their environment based on diverse thinking and an openness to change. Adaptation takes place through the environmental scanning processes and the promotion of change and development that comes with the prescribed actions through the networking, openness, relationship-building, and creativity (Morrison, 1992; Morrison, 2006). The managers must deconstruct myths and assumptions as they listen to the stakeholders to understand what is needed and when it is needed to be forward thinking to what fits best for those involved in the rural institution (Bauch, 2001). This collaboration is simultaneous and continuous to multiple needs and discussions to ensure the business's needs are met.

The reviewed literature demonstrates the need to understand what factors impact a business professional's perception. Looking at the five key themes (technology, competencies and skills, leadership, on the job training, and partnerships and connections to the community) through Bailly's (2008) second stage lens shows various points that impact perception. In this study, the researcher was able to visualize where the themes overlapped and where they altered perspectives by using Bailly's second stage by the participants' changing perspectives, differences in

perspectives, and personal educational background. Through the data analysis, participants' perspectives were unveiled and analyzed to understand how those viewpoints were related to the research questions presented in the previous chapter were viewed by rural business professionals. A discussion of these findings using Bailly's lens is included in Chapter Four.

3.0 Methods

The purpose of this study was to understand how rural manufacturing business managers perceive post-secondary education. In doing so, this study contributed to an understanding of how those who operate businesses in rural, northwestern Pennsylvania viewed post-secondary education's impact on their individual and/or business decisions. The goal was to know how post-secondary education was perceived in rural areas by business managers, which meant gathering thoughts and personal opinions from those influencing community growth and development.

3.1 Inquiry Questions

The following questions guided the framework and analysis for this study:

1. What role does post-secondary education play in rural manufacturing?
2. How do rural manufacturing professionals and businesses work with post-secondary institutions?
3. How has the rural manufacturing business professional's perception of post-secondary education changed or evolved over their lifetime?

3.2 Rational for Qualitative Research

Qualitative research was used in this study as a means to explore the perception of post-secondary education from the business professional's perspective. Creswell and Poth (2018) noted

several characteristics of qualitative research including that the research was conducted in the environment where the participant was most at ease, relied on the researcher to collect the data, provided the opportunity to move between inductive and deductive reasoning, focused on the perspectives of the participants, and provided an opportunity for the participant to reflect and respond. All of these aspects empowered the participants to share their experiences while providing views on how post-secondary education was perceived in their daily beliefs as an individual and business manager. These reflections provided stories from the manufacturing sector and the professionals' perceptions of post-secondary education.

The objective of qualitative research through individual interviews was to unravel the perception of post-secondary education from a rural businesses standpoint. Participants' perceptions reported in this study included: (a) the need for post-secondary education, (b) educational qualifications, and (c) challenges the lack of post-secondary education attainment poses for rural manufacturing business professionals and their operations. Personal accounts through interviews conducted as part of this study set a tone for future discussions, planning, and research on how post-secondary education impacts businesses employers and their community through educational and economic development and partnership.

In addition, the qualitative approach allowed for differences among responses and variables that impacted the business managers' responses and perception of the topic without the quantitative factors to compare one business to another (Mertens, 2015). There were no statistics but rather descriptions, personal reflections, stories, and relationships on the meaning and impact post-secondary education had on rural manufacturing were collected. Some participants contradicted their personal achievement and employee requirements in regard to education, but the researcher

continued to gather information throughout the interviews to determine how education was perceived overall and how that perception changed over the participant's lifetime.

3.2.1 Interviews

There are many benefits to using interviews for qualitative research, which are detailed in this section along with the specific benefits of utilizing interviews for this particular study. First, due to the limited literature available on rural business managers' perspectives on post-secondary education, interviews became a viable way to collect these participants' perspectives not only for the purposes of this study but also to contribute to the body of literature on this topic that could later be investigated in future research using similar and additional methods. By utilizing interviews, the researcher gained first-hand knowledge of the rural business managers' perceptions and allowed the rural business manager's voice to be heard and recognized as being a valuable asset within the manufacturing sector and community. This tool not only empowered the rural business professionals to speak of their business needs, but it also invited their opinions on post-secondary education. Bewley (2002) noted that discussing motives, constraints, and the decision-making process with the decision maker was the best way to learn about the business managers' thoughts. Even when there was hesitation on the part of the interviewees, the interview format still resulted in useful and important information that may not have been gleaned using another data collection method.

Furthermore, the interviews provided the participants the opportunity to willingly express their perceptions and ideas via open-ended questions (Bailly, 2012; Bewley, 2002). They allowed the participants to engage with someone outside the industry to express their thoughts and feelings without being confined to providing canned or industry-standard details. Interviews also gave the

rural business professionals the opportunity to talk openly about themselves and their business, which many times goes unheard because of their remote location. The interviews provided stories and built connections between beliefs, perceptions, and educational attainment from the participant's viewpoint.

As Bewley (2002) noted, interviews gave the researcher the chance to phrase the topic in multiple ways throughout the interview to ensure the respondent's points were heard and allowed the participants the opportunity to disclose what they wished to share in a more relaxed way. Individual interviews gave the rural business professionals a voice and did not reduce their thoughts based on the judgements or behavior of others in the room (Bailly, 2008).

Finally, qualitative data collected through the interviews also gave the participants a voice in the research by providing descriptions rather than statistics, which resulted in richer data and more detailed portraits of the participants' beliefs and experiences (Bailly, 2008). Mertens (2015) noted that one way to discover the participants' experiences was through individual interviews. Individual interviews were utilized in this study to ensure the responses of other participants and group dynamics did not isolate any participant or their personal beliefs. The individual interview was preferred to ease the participant, to conduct the research in a familiar office setting, and to ensure comments and answers from other participants did not sway them. Viewpoints directly from participants allowed for further questions to clarify the view and brought personal experiences to the description of the perception and how experience molded the view and education. Conducting this research in the rural professional's business setting provided comfort and reassurance to the participant that they could be free to speak their mind rather than any preconceived notions from the researcher or other participants (Perumal, 2014). Participants were not provided information from other participants and, with only one participant being interviewed at a time, their personal

thoughts were the only answers being recorded during the interview. This step was taken to prevent participants from changing their personal beliefs or thoughts based on what another participant reported or answered.

The interviews were designed to give the participants an opportunity to reflect on their beliefs and how business operations and interactions with employees, competitors, and educators may impact their perceptions. Reflections through stories and experiences provided insight into what may have sparked the perception to expand or change over time as well as environmental and social factors that impacted their perception. Each inquiry question was set up with sub-questions to build the understanding and connections between the perception and factors that create or influence it.

3.3 Site, Sample, and Data Collection Procedures

3.3.1 Research Site

This study was conducted with manufacturing business professionals in northwestern Pennsylvania. Northwestern Pennsylvania includes Butler, Clarion, Crawford, Erie, Forest, Jefferson, Lawrence, Mercer, Venango and Warren counties, all of which are considered rural, except Erie (Center for Rural Pennsylvania, 2014). Northwestern Pennsylvania was selected as the sample area because of its proximity to the researcher as well as the researcher's familiarity with resources and lifestyles within that area.

3.3.2 Recruitment

Participant recruitment occurred in two ways: (a) through the manufacturing association contacts and (b) through knowing the manufacturing business and directly communicating with its supervisor. To recruit rural manufacturing business professionals to the study, the researcher worked with the Northwest Pennsylvania Industrial Resource Center (NWIRC). This agency referred business contacts by introducing the researcher to business professionals who might talk about their business and develop ties within the community, which could include post-secondary institutions. The regional contact met with the researcher before contacting her business professionals to learn about the study and why it was important to the researcher and the region. After this discussion, email introductions were made with 11 regional business professionals of which nine responded; however, one employed more than 75 people and was excluded from the study. Knowing that the business and/or the representative communicated with other businesses and had the desire to work with others in the community through community development activities and discussions conveyed that the manager was likely to have interest in expressing personal and business perceptions and needs to the researcher in the study. Willingness to express their opinions and share their feelings about post-secondary education was required. Communications were sent directly to business professionals asking for their input and participation in the study directly. When recruiting the participants, the researcher ensured the business fit the location and employee criteria for the study.

The first communication to recruit business managers was sent via email to the business professional individually (see Appendix A). This email discussed the study, reason for the study, and what was expected of the participant. In addition, it was noted that, by participating in the research, the interviewee's name and company would not be directly identified and there was no

compensation for participating. All the participants replied to the original inquiry agreeing to the interview and offered times for the interview. Once the interview was scheduled, an email was sent to the participant thanking them for their participation and reiterating the confirmed interview date, time, and location.

3.3.3 Participants

The study included business professionals who had varying levels of business experience and educational backgrounds who oversaw a manufacturing business located in northwestern Pennsylvania. Participants were recruited from two northwestern Pennsylvania counties. The reasons for selecting participants from these counties was first and foremost their proximity to the researcher. Speaking with the participants face-to-face was important to foster an open discussion (Twining et al., 2017). Manufacturing was considered to be a leading employer in this region, behind health care, and social assistance (Miller & & NC3T, 2015). Manufacturing jobs in this region included tool and dye operations, fabricators, machinists, hardwood flooring, and metal and plastic operations. The business professionals recruited to participate in this study owned or oversaw a manufacturing operation within 30 miles of some type of post-secondary education institution.

In total, eight business managers were interviewed for this study. Participants were solicited from the manufacturing sector from businesses with between 25-75 employees located in northwestern Pennsylvania. There were no restrictions on the educational achievement of the business managers participating in the study. In fact, background information was not known to the researcher until it was collected during the interview about the businesses and its managers, and then it was used to understand how education was or was not already included in their daily

operations and ingrained within the participants’ personal beliefs. All participants had some type of post-secondary education experience: two took some coursework, one earned a certification, four earned a bachelor’s degree, and one earned a master’s degree. Business managers were classified as an owners or as a chief operating officers within the manufacturing company. While some of the companies were familiar to the researcher, the research participants were not known the researcher. Table 1 below displays participant characteristics.

Table 1 Participant Characteristics

Pseudonym	Years in Role	Ownership Type	# Employees	Highest Degree Earned
Michael	6	Multi-owner	25	Coursework, no degree or certification
Laura	18	Family-owned	26	Coursework and Certification
Charles	47	Family-owned	33	Bachelor Degree
Howard	3	Corporate	33	Bachelor Degree
Sally	11 months	Single owner	35	Coursework, no degree or certification
Victor	22	Family-owned	45	Master's Degree
Clifford	5	Corporate	56	Bachelor Degree and additional training
Paula	5	Family-owned	60	Bachelor Degree and additional training

3.3.4 Interview Protocol

The interview protocol was designed to understand how post-secondary education was perceived at a personal and business level by those who own or are influential in managing manufacturing businesses within 30 miles of a post-secondary education institution in

northwestern Pennsylvania. Questions asked in the interview allowed the business professionals to expand upon their views as to how post-secondary education assisted with employee development as well as how the businesses utilized local institutions to expand their training and outreach. Each interview was an inquiry-based conversation where the participants expanded their thoughts with correlating stories. In addition, this format provided the interviewees the opportunity to express how they saw post-secondary education impacting their employees, the business, and the future of the region. All the questions were based on the researcher's understanding that there is limited research on rural post-secondary education, and neither rural business managers' voices in general nor their perspectives on post-secondary education are well-represented in the literature (Castillo-Montoya, 2016).

There were three inquiry questions guiding this study. The first inquiry question looked at the industry and how post-secondary education impacts it. Since the researcher was not familiar with daily manufacturing operations, this inquiry question gathered information on for how post-secondary education was or was not part of daily processes and business needs. The analytical codes generated during data analysis were based on training and skills needed by the employer and how education was part of those needs. Codes included software, skills, and competencies that an employee needed to fulfill in their role at the business. The second and third inquiry questions focused on the rural business professional's views of post-secondary education and how their views may have changed over time. This included factors that impacted the interviewee's perception and communication stemming from their personal educational achievement level as well as the education level of those they were working with at that time. This allowed the researcher to look for connections between the interviewees' own post-secondary education and their expectations for their employees

This protocol gave the interviewer an opportunity to collect deeper insights from the interviewees and draw inferences from a smaller number of participants rather than aim for breadth without depth from a larger pool of participants (Pandey & Patnaik, 2014). The goal of the study was not about how often the manufacturing business manager thought about how post-secondary education can impact or how often it was needed by the employees but more about how education itself was viewed and involved in the manufacturing business. Knowing how the rural business professional perceived post-secondary education guided inferences about the ways post-secondary education was valued within the region. The researcher attempted to identify emerging themes related to education throughout the interviews. Each participant provided personal accounts through words and stories of how post-secondary education was perceived and how education impacted business decisions throughout the interview.

3.3.5 Interviewing Procedures

After receiving Institutional Review Board (IRB) approval, the researcher contacted rural manufacturing professionals about their interest in participating in the study via an interview at their business location. Each interview was guided by the inquiry questions to learn how the business manager's perception of post-secondary education has evolved, which was demonstrated through participants' stories, examples, and experiences.

To begin the interview and to build a rapport with the interviewee, the researcher asked demographic questions about the professional's education and leadership followed by questions about the business classification and years in operation (Mertens, 2015). Participants were given the opportunity to expand on the questions related to their business and their perceptions of post-secondary education. All interviews were recorded without any visuals, and the researcher took

handwritten notes simultaneously to record key terms and preliminary themes. The participants were given the option to end the interview at any time as well as to choose not to answer a question or raise additional issues or comments in the interview that were not specifically asked by the researcher. No participant declined to answer any question or ended the study early.

Time was allotted at the end of the interview for the business managers to speak freely about their understanding of post-secondary education, how their business has worked with post-secondary education, or how they saw post-secondary education working with their rural business needs in the future that might not have been discussed throughout the interview. The researcher asked follow-up questions to ensure the manager's comments and perspectives of rural business and education were understood and documented correctly throughout the interview. Once each interview concluded, the recording was transcribed within 48 hours to ensure the notes taken by the researcher matched the transcription and themes could be coded.

The researcher believed that the open-ended, semi-structures interview approach provided the opportunity for the researcher to be sensitive to the work environment and business needs while collecting data and understanding the perceptions of the participants (Creswell & Miller, 2000). Throughout the interviews, it was expected that the participants would provide personal experiences and reflections to explain their perceptions and answers to the questions asked. Their varied experiences impacted their perception and response between questions. This support in providing the rural business professional's voice to be heard about post-secondary education allowed for the personal and interactive data collected expected of constructivism (Mertens, 2015). The varied voice and perception of these professionals was important to gain an understanding of their perceptions of post-secondary education in the past and currently. In order for the study to be successful, it was important to know the participating business needs and how post-secondary

education was or was not part of their needs in rural northwestern Pennsylvania. The differences and similarities showed how perception varied throughout the manufacturing sector and could be used in future academic program proposals by institutions in this region. This fits the constructivist approach by listening to business managers and supporting their thoughts when drawing conclusions from the study instead of using pre-determined perceptions by educators or the researcher of how post-secondary education should be perceived in rural manufacturing businesses.

By meeting with the researcher individually, the interviewees knew their voice was being heard, and the researcher was able to adapt the interviews to better meet their needs and views. Whether the researcher personally agreed with the participants' views or not, participants were given the interviewer's undivided attention to understand their perspective and how they developed this perspective over time. Before collecting data, it was the researcher's belief that the educational background of the business professionals and their past experience with varying educational achievements of employees impacted the rural manufacturing business professionals' perspectives of post-secondary education. The goal was to identify what impacted these perspectives as themes to guide future post-secondary education development and the opportunity to expand the literature.

Audio recordings were transcribed using Otter and hand-coded to find the themes and key points of interest discussed in the interviews. The researcher scanned the transcriptions and codes for relationships that were discussed regarding education, skills, beliefs, and business as well as key categories of the discussions that led to themes and further coding to ensure the data were noted and reflected. Every attempt was made to note body language and to understand social and

cultural context of the workplace environment throughout the interview to aid in deciphering how various keywords and themes impacted the business manager (Mertens, 2015).

Analytic memos were written based on reoccurring themes in the interviews and provided written documentation of how that theme was conveyed in the interview through the words of the participant. It was understood that each interviewee's personal experiences impacted their responses to the questions in the interview and their overall perception. These personal experiences impacted the conscious and unconscious connections between education and manufacturing. The employers' beliefs were the unconscious thinking where the productivity and the interactions of the employees made up the conscious thinking (Cai, 2012). The researcher analyzed each interview knowing that every participant's views and business needs may or may not have included education and that their personal education level may or may not have impacted that perception.

Confidentiality was maintained throughout the coding and analysis using pseudonyms for the participants and the businesses to ensure anonymity. All references and quotes included in this manuscript were free of any identifying information. Handwritten notes and documents received during the interviews and transcriptions were kept in a locked file cabinet that was only accessible to the researcher. Coded data and digital transcriptions were stored in Box, a secure online software program.

3.3.6 Timing of Study with COVID-19

The interviews were conducted as the COVID-19 virus was visible within the United States. All of the interviews were conducted prior to the pandemic announcement and the uptick in cases within the Commonwealth of Pennsylvania. At the time of the interviews, the Commonwealth had not placed restrictions on businesses about operations or the need for personal

protective equipment (PPE). After the Stay at Home Order was initiated within northwestern Pennsylvania, some of the businesses within this study adjusted their operations or altered their focus to meet the restrictions. At least one of the companies was noted in the media to have changed their production and created protective shields and masks for healthcare and other industries. This enabled the workers to maintain employment throughout the pandemic and aided essential personnel in northwestern Pennsylvania.

3.4 Data Analysis

A spreadsheet was used to determine connections between the data using Bewley’s (2002) coding format. Each row was an individual theme and each column was a different participant’s responses. When coding the interviews, the researcher placed paraphrased and direct quotes from the participant into the spreadsheet. These data indicated how the business manager related to and visualized post-secondary education. Table 2 provides a brief example of the coding process.

Table 2 Coding Table

Area of Bailly’s Model	Definition	Keywords
The initial beliefs of employers about education	Factors that impact the business professionals’ belief of post-secondary education and its impact on their hiring	Skill requirements, degree requirements, educational knowledge, wage expectation/need based on education, partnerships or educational connections
The anticipated value of a post-secondary college graduate in the business	The expectation of the business/business professional of the employee based on their education level	Skillset, communication, interpersonal skills, nature of the job/work, impact on productivity, and access to post-secondary education.
The actual productivity and performance of post-secondary college graduates	The output of the employee with post-secondary training, a certificate of completion, or a college degree	Worker characteristics, employee motivation for performance, credentials, desire to continue education, on-the-job training.

Coding was based on Bailly's (2008) framework of the second stage of the development of the employers' beliefs, which included the initial beliefs of employers about education, the anticipated value of education in the business, and the actual productivity and performance of educated employees (Cai, 2012; Mullen, 2014). What the employers saw in the workplace and in their interactions with others impacted the external factors in stage two. This deductive approach was based on Bailly's work where, through trial and error, perceptions were formed and reframed to meet the business needs. The external factors in this study that fit Bailly's model included educational expectations of employees and the relationships with post-secondary education institutions. Keywords enabled the researcher to conclude how post-secondary education was perceived and utilized in manufacturing operations within rural northwestern Pennsylvania. The keywords included: diploma, degree, education, on-the-job training, knowledge, competencies, and skills. Data collected in this study were therefore analyzed with the understanding that the perception of the business manager changed over time and that external factors such as access to post-secondary education and employee skill-base influenced the change in perception.

Once the data were analyzed through the framework, they were then organized by how they answered the inquiry questions. The first inquiry question about post-secondary education's role in rural manufacturing was based on the business professional's initial belief, so the value of post-secondary education was answered through the way the two sectors collaborated or did not collaborate. The actual productivity in the third area of coding indicated the way the business manager's perceptions had changed or evolved over time.

3.5 Credibility and Trustworthiness

By keeping the interviews semi-structured, some questions were predetermined and responses to similar questions could be more easily compared to each other. This ensured themes could be adequately coded and that the data could be compared equally (Perumal, 2014). Member checks in the form of analytic memos were written and sent to the participant following each interview. This ensured that what the researcher heard and interpreted accurately reflected what the interviewee wished to express and ensured the data collected were valid (Mertens, 2015; Miles & Huberman, 1994). Memos consisted of interview data that reflected the inquiry questions. They were synthesized with analytic meanings of the narrative that were then used to process the data. Using analytic memos allowed the participants to review their comments, communicate any corrections or additional thoughts following the interview, and correct any misrepresented jottings from the interview. Member checks ensured that the data were being interpreted correctly and established data credibility (Thomas, 2006). Therefore, the analytic memos were a way to ensure credibility, because participants were able to review their comments and correct any misconceptions or add any additional insights after the interview that may have portrayed their perception more precisely. This also was a way for the participants to provide feedback on notes (Mertens, 2015). The researcher's faculty advisor also served as a checkpoint to probe for additional insight from the researcher and inquire about the findings and analysis. With this continuous analysis and checking, the researcher ensured credibility (Lincoln & Guba, 1986).

During the course of the data collection and analysis, there was no identification of the researcher's employment within a post-secondary institution in the region. This ensured that the participants did not feel pressured to answer questions to please the researcher or to feel they

needed to perceive post-secondary education as a necessity for their business or sector based on the researcher's employment.

When looking for recurring themes across the research participants and when drawing conclusions, the researcher attempted to increase objectivity by setting aside her personal beliefs in regard to the study topic. Themes were based on concepts reiterated by the interviewees including education, training, and competencies.

3.6 Reflexivity

Having always lived in rural areas with at least one post-secondary education institution located within 15 miles of my home, I was always encouraged to pursue a post-secondary degree. Going to college was an expectation, it was not a matter of where or what I wanted to study as a career, just that I would graduate high school and go to college. Although this was the mindset drilled into my upbringing, today I believe that post-secondary education is not always necessary for every high school graduate or for someone who wants to change careers. While I believe post-secondary education is important and should be available, learning trades and on-the-job experiences can be just as valuable to expanding opportunity and providing the training needed to complete a task or be successful in a career. Therefore, my perception of post-secondary education has changed over the past 20 years, and that could also be the case of many business professionals who live and work in rural areas as well. Times have changed, but it is not always known if the perception one carries has adjusted to the environment surrounding them or their own personal background with education.

While working at a rural institution, I have always encouraged students to earn at least an associate's degree because that will give them some advanced knowledge, and no one can ever take their education away from them once they complete their degree. As my institution transforms to better prepare northwestern Pennsylvania industries, I reiterate the importance of understanding how education is perceived by business managers who influence others as to if they should continue education after high school.

This study provided valuable insight on the perceptions of rural business leaders that are not present in the literature. The data collected through the interviews in this study enhances the understanding of what post-secondary education means in northwestern Pennsylvania. My hope was that the information divulged through this study would enhance how post-secondary education may be a resource in rural areas to better serve and relate to the businesses in the area.

3.7 Researcher Role

Because I was employed by a rural two-year institution at the time of the study, I needed to ensure any biases toward post-secondary education were set aside for this study. To do this, I did not address my work in any interview or discussion to ensure that my career in education did not sway the participants' responses. My personal connection to post-secondary education was not used to push for or against post-secondary education. Ultimately, my role in this research was to hear how the participants saw post-secondary education from a business and personal level, not as an educator.

My passion for this research was to know what rural Pennsylvania businesses needed in order to thrive and to understand more about their needs to aid their advancement and development.

This eagerness to understand rural business and development and how it relates to post-secondary education enhanced my thoughts for academic programs and opportunity to build partnerships in the future between post-secondary institutions and manufacturing businesses in rural areas. By conducting this research study, my upbringing in rural Pennsylvania and background in post-secondary education blended together to increase awareness of the rural business professional's perception of post-secondary education and how post-secondary education impacts rural business development.

3.8 Reciprocity

While this study was not specific to any institution or business development program, the findings were shared with colleagues at rural institutions. My hope was that this would prompt institutions to consider expanding their offerings or develop relationships with rural manufacturing businesses. My intent was to share the information through presentations at business development group meetings so they would know how post-secondary education was perceived by northwestern Pennsylvania manufacturing business professionals and so that post-secondary institutions would also have this knowledge if they wanted to expand course or program offerings in the area. A final point was to share the findings for potential program or workforce development funding. Unfortunately, due to the COVID-19 pandemic, these groups stopped meeting; therefore, the findings from this study were not able to be shared in that format.

3.9 Researcher's Epistemology

When I looked at the future of post-secondary education as a researcher, I saw the need to be proactive in developing partnerships between business and post-secondary education and meeting the needs of businesses in order for the region to be sustainable. While my current institution transitioned to a new model to meet the needs of the region, some important voices in the region, such as rural manufacturing business professionals, remained unheard. Individuals representing these industries brought a personal belief and a business need to the discussion that may or may not require some employees to obtain a college degree. Knowing my institution was looking at the needs of employers in the region at the time of the study provided me the motivation to build on my passions in post-secondary education and business development to look at this sector to understand how the rural business managers perceived post-secondary education to later determine if there was away the two could aid each other.

This study took a constructivist standpoint, which considered the experiences and recollections of the participants when constructing an understanding of the hierarchy of communication, power, and opportunity within the rural manufacturing sector (Creswell & Poth, 2018). The views expressed by the professionals helped create the researcher's understandings of the study's findings rather than the researcher coming to that finding by interpreting the participants' intentions on her own.

3.10 Limitations

There were several limitations within this study. First, the study took place in northwestern Pennsylvania and included only a small sample of the businesses and industries within the area. Educational requirements for employees within the manufacturing businesses were different based on the specific mission, strategic plan, and operations of each business. Variables such as the type of business and the proximity to post-secondary education impacted business managers' perceptions of post-secondary education; therefore, it was beneficial to note that all supervisors interviewed operated a business within 30 miles of some type of post-secondary education institution. These same perceptions may not be applicable at businesses in northwestern Pennsylvania or other areas that are further than 30 miles from a post-secondary education institution.

The researcher always lived in rural areas and believed in the needs and prosperity available in rural areas. This could have led to assumptions that the researcher's beliefs and experience with a struggling rural institution may have skewed the analysis or that her connections within rural communities impacted who was interviewed and how the interviewee related to the researcher. Participant selection, data collection, analysis, and the final report were completed in fairness to all involved and ethically done so with an open mind and professional frame of mind.

4.0 Study Results

The primary purpose of this study was to understand rural manufacturing business managers' perceptions of post-secondary education. To learn about these perceptions, I conducted interviews with eight chief operating professionals and owners of rural manufacturing operations within Crawford and Venango counties in northwestern Pennsylvania. This chapter contains the qualitative findings around the three inquiry questions.

4.1 Inquiry Question #1: “What Role Does Post-Secondary Education Play in Rural Manufacturing?”

While rural manufacturing business managers expressed that post-secondary education was important overall, they based their hiring decisions more on the applicant's skills and experiences rather than a post-secondary credential. These professionals looked for self-starters who knew how to operate machines, function in a safe manner, and be precise in their tasks. All of the participants noted that skills meant more than certification or degrees in manufacturing and emphasized ability and precision as the industry's focus rather than book knowledge. These managers indicated they expected skills, not certification, in many manufacturing roles. The only specific positions the managers noted as roles that required specific certifications and/or degrees were welders, electricians, and human resources professionals. Several participants reiterated that experienced workers produced better quality work. From the interviews, it was understood that experience included knowledge of machine and manufacturing operations.

When discussing skills, most supervisors noted a desire for employees with some type of training and skill credentials. One participant noted that training is possible through YouTube where the options are limitless as to what one can learn for a task or in preparation for a manufacturing role. Laura believed that one could learn skills, processes, and operations on YouTube through how-to videos. She said, “[When] you learn online, you know a lot, so the internet is a good resource for education. You really should learn something every day; learn something new all the time.” This was one reason she depended less on post-secondary education to provide skills training and focused more on math and technical skill needs in her employees. In addition, Charles noted watching friends and relatives who work in the trade or have a hobby that utilized these skills as a training option for employees. When talking about his employees’ skills, he said, “These guys are doing what they know, they already learned it from vo-tech, or they go to a friend or relative and that's helped us a lot.” He believed friends, relatives, and fellow employees could also teach skills just as much as post-secondary education schools but in a shorter amount of time and with less monetary investment to the employee and employer. The individual showing their skills and understanding could be a mentor in the field who may or may not work at the same business as the employee but is a resource when there are questions.

According to Laura, one drawback when depending solely on post-secondary education was the inability to understand the applicant’s knowledge and abilities from the letter grades on a transcript. She suggested that grades on a transcript do not truly articulate the knowledge and capabilities of a student in the classroom or in a manufacturing operation. “When I went to vo-tech a B sounded pretty good. But, here, you put a hole in the wrong location; it would fail because that's scrapped. That's one of the problems, it [the course grade] needs to be pass/fail,” according to Laura when she discussed understanding how much an employee knows about their skills and

the job requirements. In her opinion, there needed to be skills testing and showcases to prove talent and ability to employers. When an employee knows what they are doing, they are less likely to make the “wrong cut,” which costs the business money when it cannot use a part. She indicated that letter grades are not helpful in manufacturing, because the industry based its standards on knowledge and skill not textbook knowledge and facts. This helped the employer understand whether the employee knows what they are doing or not based on their pass/fail grade on the transcript.

Several participants agreed that there was too much emphasis on everyone earning a college degree. They argued that not every person needs a degree within the manufacturing industry or to work in general; learning technical skills and being able to apply them was just as important. Paula summed up her thoughts by stating, “The job experience portion of a resume speaks way greater than a degree. Just because you are able to get a degree doesn’t mean you can apply it.” In addition, Michael said,

We hire a lot more people for their skillsets than their education. Because we have several people here that never went to any formal education program, but they have the qualifications and the expertise that would come with an apprenticeship.

The participants reiterated their belief that there should be more credit allocated in the hiring process for trade skill and knowledge than for earning a degree; skills and understanding mean a lot more, especially in manufacturing. Specific skill or training required for positions is included in the job posting and interview process to ensure the applicant understands and can perform the tasks for that process.

4.1.1 Developing Trade or Work Skills

When asked what role post-secondary education plays in ensuring employees have the proper skills and training, the participants discussed programs and specific skills involved in rural manufacturing. Skills and competencies resulted in candidates being hired. These manufacturing business managers noted that they would like to see technical trade and apprenticeship programs offered in northwestern Pennsylvania. They believed that once someone received trade training, that employee's productivity would increase. Charles mentioned that he has worked with generations of employees since workers recognized the stability of the older generation and understood that the salary and benefits provided the company could provide.

One point reiterated by many participants was that they had less liability when hiring educated employees in manufacturing, because the certified or degreed workers knew the expectations and requirements to complete the job. Laura mentioned that educated employees are "Going to start off more valuable because they're bringing their education with them. So basically, they are typically going to have a higher starting wage and they also have a positive impact on the other employees." The educated employees tended to share their experience and knowledge with their coworkers to ensure they understood each other on the production line.

Certified and degreed employees had the skills and knowledge to be able to communicate with others and ensure worker safety and the development of products that meet or exceed industry standards. Participants noted three occupations or certifications needed in the region: electrician, welder, and CNC machinist. Within these certification programs, individuals learn how to solder wires, prepare wiring, make a proper weld, select types of welding materials, calibrate machinery, and much more. Charles expressed that applicants created a weld coupon during the interview to

ensure the quality of their craftsmanship and skill to be a welder. If the school/training center did not teach the applicant properly, the missing knowledge would be evident during the interview.

4.1.1.1 Apprenticeship Programs

Participants noted an interest in apprenticeship or journeyman programs to train workers. Manufacturing business managers seek job candidates who went through these programs to bring more skill-focused training and education to the region instead of always looking at job candidates who hold post-secondary education degrees (e.g., associate, bachelor, or master degrees). Apprenticeship programs provide employees a better understanding of processes and safety within the field. The participants who indicated this preference noted that employees who did not go through apprenticeship programs but who learned on their own, from a friend or family member, or from how-to videos, did not have skills that were as precise and visible as employees who went through apprenticeship programs. While some manufacturing business managers said there was a need for these apprenticeship programs in northwestern Pennsylvania, the supervisors also noted they could not guarantee enrollment in such programs because they did not know if residents would enroll and commit to these programs. Sally agreed with other participants that:

While [post-secondary] education is very important, it doesn't necessarily give them the hands on skills that we like to see. As with any job, you know, you hire somebody with a degree they don't have the experience that you might need that's very important for us. They need to have some type of technical training or experience. So many of the gentlemen have been here for 20 plus years and some of them might have gone through the journeyman training and some might not, but by far experience over education is most important for our industry.

Her thoughts were that she preferred hiring experienced tradespeople, but she also knew that was not always applicable in rural areas. She also brought training to her business for the employees so they could continue to learn about the trade and gain knowledge and skills about various equipment and processes.

Michael talked specifically about how his company worked to obtain an apprenticeship program to recruit employees and assist with training interested residents in manufacturing jobs. His concern was that people did not take the initiative to learn the trades for the jobs available in this area. Unfortunately, the company stopped offering the apprenticeship program within a few years due to a lack of interest. Michael noted that less than five people entered the program. Of the people who started the program, no one completed the entire program because they found jobs that paid a dollar or two more an hour, or they did not want to take the time to learn the skills needed for the various aspects of each role within the company. He said, “The biggest thing I see is the lack of wanting to pay the price to get the skillsets.”

Laura noted that her co-owner was a trained journeyman, and she has had the privilege to work with and hire other journeymen during her tenure in manufacturing. When these programs ceased to be offered in the region, she claimed that manufacturing started losing the specialized skillsets and training to serve its clients, because the employees had less desire to work hard and use their skills. Her focus was on journeyman programs and that:

To become a journeyman, you have to be pretty skilled. And by the time you [the employer] want somebody to be a journeyman and want to put the money into them, they're already skilled enough and they could be making money. So they're already so skilled by the time you decide they should be [a journeyman] then maybe it's not worth that anymore.

It takes money and time for the employee and the employer to complete a journeyman certification through the Department of Labor and Industry, which is a drawback for this program. However, when an employer can hire a journeyman, they know that individual is highly marketable and is knowledgeable and committed to the industry.

Howard relocated to the area to be the business manager within his company and expressed optimism that within the next few years the community would house a technical program. His hope was that the technical program would entice graduates who are unsure of what they want to do after high school but know they need a trade or skill to work in manufacturing in the region. It could provide a skillset for them and a base job to demonstrate a work history after they learned the trade. He said,

I'm excited about the prospect of some type of technical program to get kids into something where they don't have to move away from home. And if we can marry that with some type of co-op program, we can reinforce the business and technical skills that they're gaining with work experience. Hopefully, when they graduate we have an employee that we can hire full-time that has skills, takes their career seriously, and can look ahead on the path and make decisions today that are going to be beneficial for them five, 10, or 15 years down the road. That's good for them, and it's good for us.

4.1.1.2 Computer Aided Drafting and Blueprint Reading

Manufacturing business supervisors wanted more options for sales, tool and die, CNC machining, electricians, and design trainings, courses, and programs that would elevate their employee knowledge to the next level. These managers expected educated employees to all learn the same concepts and skills no matter where the employees received their education. However, most of the manufacturing managers in this study indicated they did not truly know what was

included in courses listed on a post-secondary transcript to identify how and if those courses could be beneficial in manufacturing. Especially with general education and soft-skill courses that teach fundamentals and personal growth, it seemed some of these manufacturing supervisors saw those as “fluff courses” while other managers in the study saw the courses and believed educators delivered these courses as self-development and knowledge to build on after graduation.

These manufacturing business professionals looked for employees who could read and write code and/or who were able to handle and understand the controls of the machines depending on the industry and tasks required of them within the business. Since training certifications provided many of these skills, advanced degrees were not required. The preference among many of these participants was to hire trade school graduates; however, there were a limited number of trade school graduates in northwestern Pennsylvania at the time of the study. Trade school graduates start with a basic knowledge of the trade and over time develop more precision and skill.

Howard talked specifically about how he hired maintenance employees, for example. These employees are required to be certified electricians. That certification and skillset is specific to the job requirement; however, a general laborer can and will receive a lot of on-the-job training as they progress into higher-level technical positions within the production line. The example he provided was that a maintenance worker knows the machines as well as calibration skills and uses for the machines to ensure they do not overheat or damage the materials used in the production.

Laura said, “I went to vo-tech and that didn’t make me a machinist, but it made me understand it. But so many of them, I think, sometimes believe they are machinists because they have certificates.” Her company needed personnel who, while operating machinery, could read blueprints to understand what the client needed. When reading the blueprint, the employee needed to know the materials to use, the dimensions, and the function of the part. She explained that

many of her employees never saw a blueprint until working at her company. Laura and her staff assist others with understanding the basics of blueprints so all employees know where to start and how their precise cut or weld affects the end product and design.

Computer Aided Drafting (CAD) knowledge and ability was important within manufacturing to develop the drawings for the parts and products available through the manufacturer. Knowledge of this software assisted the employee with designing the client's product need. Before starting the design process, the employee also needed to know the materials each machine could process and the possible dimensions for the products manufactured. Some of the managers who had this software noted that they understand CAD; others expected their employee(s) to know it. Still others did not use CAD; therefore, the demand and interest in this training and knowledge varied amongst the participants. Howard agreed with the trade training stating that,

Any type of technical training in CNC work or milling [would be great in our area]. Once people go through those programs, they get comfortable working with equipment. And they get comfortable working with numbers and translating something that they measure into something that they do. And then measure and iterate through that process again and again until they dial in the product specification, that's important. The skills you gain are transferable with very little training on our part to get you up to speed.

4.1.2 Developing Technical Skills

Participants noted there were technical skill components they sought to ensure employee and business success rather than degrees. Technical skills were the basis for their work and what the employees needed to start their tasks and to build upon to the final aspect of their job. These

participants hinted that, as manufacturing modernizes and adds more technology-based equipment and operations, these technical skills may alter; however, at the present time, workers did not need to be focused solely on technology but more on understanding safety, calculations, and data entry.

4.1.2.1 Safety Skills

Safety was one of the most important aspects workers needed to know, and post-secondary education could deliver that knowledge through discussions of case-law and liability. Included with safety are the workplace areas, protective gear, and the machinery. These three parts are intertwined for a manufacturing operation to be safe and successful. Sally brought trainers into her company to update her staff on the safety and operation of machines to ensure everyone knew the information at once. This also allowed the employees to ask questions to make sure they understood and were safe on the production line. She claimed:

We've offered to employees that we've hired that have a little bit less experience than what we would like, some inside training. A lot of machine shops have some inside training, just because exactly what you need your employee to know, isn't necessarily available at a technical school.

Clifford stated a need for training and education on how the machines operate, how to work safely within the shop, how to repair and build manufacturing machinery, as well as computer skills. That could include advanced skill training at a vocational school, an apprenticeship program, or a certification or degree from a trade school, college, or university.

4.1.2.2 Math

Within manufacturing operations, the participants indicated they needed employees to function without technology and have the ability to process numbers and figures on paper or in

their heads without a calculator and computer. The participants specifically mentioned the need for employees to know geometry, algebra, and fractions. Mathematics was involved in all aspects of manufacturing from quoting bids, designing parts, setting up machine cuts, and shipping.

Laura spoke in depth about the need for and importance of math skills within manufacturing. Other participants noted math being an important understanding, but she talked about how it is a factor in every aspect of manufacturing—from the front office, to the shop floor, to shipping and receiving. She said every area has its own set of tasks, but math is involved in the inventory, pricing, and precise cuts of the products.

4.1.2.3 Computer Skills

As manufacturing business supervisors upgraded equipment, these participants noted an additional need for computer skills. Every participant noted that their office staff needed to know how to use word processing and spreadsheet programs, but some participants noted that their laborers also needed that understanding in order to maintain efficiency on the production floor. Most of the participants mentioned a need for basic computing skills. Ideally, the managers wanted employees to know how to use computers and have the skills to manipulate data. For advanced personnel and office staff, the participants identified a need for training, certification, or a degree that enabled them to know data and word processing software as well as industry standards and requirements for their focus area within the office/operations. All the participants who indicated a need for computer knowledge referenced Microsoft Office as the preferred software used within the businesses.

Within the office at his plant, Howard noted the staff, “certainly require skills and Microsoft Office Suite, but they don't necessarily have to have a certificate. It can be just demonstrated knowledge.” This was another point summarized by the participants’ beliefs that

skills are more important than a degree in manufacturing, including the office area in the success of the business. Laura stated:

A lot of the machinists here are very smart, obviously, or they wouldn't be here, [but] we do have a high attrition rate. But it's hard because you have to teach them how to use a computer before you can teach them how to use the CAD and CAM software.

She continued that the best training and skills an employee brings to the company are strong math skills in calculus and trigonometry, because workers use those skills every day from actually making the parts to inspecting the parts. The industry was “gritty but intelligent,” according to the owner who stated the workers get dirty and perform hands-on tasks; however, they continue to be intelligent and educated. Her company required every employee to know how to use and understand Microsoft Excel, because it was how the company enters, tracks, and processes orders. In addition, once a client placed an order, they had access to the database to check the status of the order. At each step of the production process, the employees update the system within the Excel spreadsheet.

However, Laura continued her thoughts by stating the company continued to look at different software and technology to see what is available to assist their operations. Her comment was, “We're like, what does this software do? And if somebody came in and knew [software], it would be valuable.” She expressed surprise at how many applicants and employees she had trained who did not understand how a computer and software can assist the worker and operations.

Paula noted that, after she became a supervisor within the company, the team started using computers more. She believed she developed her typing skills and computer knowledge in college and “In defense of our people who don't have computer skills, there was no requirement. But we're trying to do things above and beyond what we've done previously with data mining analysis to

help make more informed business decisions.” It had not been a requirement to know and understand computers and computer software at this company. However, as a new business manager within this business, she and her co-owner planned to expand its digital standpoint and conveyed that employees with computer knowledge would be beneficial in that endeavor.

4.1.3 Developing Soft and Personal Skills

The soft skills employers looked for can be learned in a variety of ways, but the participants’ hope was that employees grasped varying levels of confidence, responsibility, and personal development to work independently or as a team member within the production and office areas. A summary of the participants’ thoughts was that it takes everyone owning their personal actions and maintaining their efficiency for the company to remain reputable with its clients and grow the business operations.

Participants noted that applicants need to be diligent and possess a strong work ethic to work in manufacturing. Howard noted specifically that he looks for the employee’s ability to express their commitment to be at work on time, perform the required tasks, be safe on the machines, and focus for an entire shift. Educated employees were more positive in the workplace and were more willing to share their abilities with others around them. Howard pointed out that that students developed a routine and commitment during post-secondary education, so, once they graduated, they continued that commitment to arrive at work and perform their task(s) efficiently, which is one reason post-secondary education was a benefit for his employees. “I want them [graduates] to walk across the stage Saturday, and I want them here on Monday morning for orientation,” Howard exclaimed. He clarified his point by saying his hope to hire a student to start working immediately after graduating because they are in a routine to wake up and stay focused

for a period in school that becomes their time at work. In addition, those committed to completing a training or education program typically have not had the time to develop habits to not show up for their obligations. Additionally, the thought was those in training programs were less likely to have criminal backgrounds that could impact the manufacturing business manager's ability to hire them for some positions. There are roles within some manufacturing operations that require financial stability, substance-free influences, and continual operation, which requires employees to be on time for work; as one shift ends, the next operator needs to be present and ready to take over control of the machine.

These professionals agreed that post-secondary graduates bring a more positive attitude and want to work when they come into the business. Graduates know the trade and are willing to share it most of the time with others they are working with, so they too can learn how to be more efficient in their job. Certifications, training, and degrees provide confidence in workers. Charles noted this by stating, "Confidence does a lot of things. You can get your machine skills certificate and this gives you more confidence [in your work and ability]."

Manufacturing business professionals indicated that the industry requires communication throughout the business. One reiterated point was that the sales team must present clear and concise product information and proposals, and then communicate the client needs to the developers and designers, who must create clear drawings or plans of the products. Laborers must communicate to each other and with the shipping department about the progress of the production. Employers said there were individual and group communication needs every day and in every aspect of manufacturing.

Victor's experience with his clients was that many preferred to work with educated salespeople. While he had earned a degree, some members of his sales team had not, but he knew

which clients the experienced but non-degreed employees could and could not work with for sales. The belief was that educated employees communicate effectively with the client. He said his instinct was that educated employees can relate better to others, are more open to new ideas, and have a larger vocabulary, which means they have interpersonal and self-development skills to function independently or with others. While he appreciated teamwork within his operation, he knew salespeople must think on their feet. Other participants reiterated his thoughts that knowing their staff and clients determined who would communicate throughout the various points of contact and the order process.

Managers seek employees who can rely on their instincts and develop concepts on their own without depending on technology or others to direct them. Independent thinking required the employees to rely on their knowledge and skills to increase awareness, develop initiative, and spark creativity to complete a task. Learning critical thinking skills was helpful because it allowed the worker to think through a process or need and find the best way to complete the task. Clifford noted he that was looking for critical thinking skills in his employees. He said, "That's what separates someone who moves up in business versus someone who just picks up a board and lays it down and picks up a board again and lays it down again." The participants sought workers who possessed this type of critical thinking and problem-solving skill. These supervisors stated their desire to have workers who recognized issues, identified ways to increase efficiency, and communicated with others to address their concerns promptly or adjust to the demands and needs of the business operations quickly.

In addition, they were looking for collaboration amongst employees and between employees and clients. Participants felt post-secondary education was a place where employees could develop teamwork, because they would depend on others and others would depend upon

them within coursework. What the participants indicated was that workers needed to understand teamwork. With this learned skill in life, they would work well with others and communicate their needs through the entire production process.

Howard summed up his belief that employees “Just have to come to work, be able to learn, work safe, get along with each other work as a team, and generate ideas.” Aside from these skills, his company would teach any additional skills needed in production and sales within the company. When employees were willing to work a couple of years in manufacturing, the company would provide the opportunity to train and promote the employee as positions opened.

4.2 Inquiry Question #2: How Do Rural Manufacturing Professionals and Businesses Work with Post-Secondary Institutions?

4.2.1 Connections with Alma Mater

Manufacturing business supervisors noted they were selective regarding post-secondary education institutions with which they chose to communicate about business needs and successes. From the interviews, it appeared many times these manufacturing professionals only networked with their alma mater and connections from their employees’ alma mater to recruit new employees or discuss their business. This was because the managers understood the academic program offerings and graduate potential with these connections based on personal experience.

4.2.1.1 Giving Class Presentations

Manufacturing business managers connected with students in post-secondary education by giving presentations or participating in panel discussions. Typically, personal connections with instructors developed the connection to participate in past presentations. Many of the presentations the respondents participated in did not focus solely on manufacturing; there were multiple aspects of manufacturing or business within one setting to educate the students. Many times these sessions were an opportunity to talk about the pathway into their leadership role while explaining the importance of education and their expectations of employees. Because the presentations were given in a classroom setting, the students focused their attention on the presenter, which provided a more candid conversation. “The basic thing was that they wanted to know what to do with industry specific skills,” according to Laura’s experience with classroom presentations. The students learned about the field and the specific businesses to determine if they wanted to work with that professional or within that industry.

When Paula moved into the supervisor role within her company, she noted there was not a connection with post-secondary education. However, after receiving an invitation to meet with classes at several institutions, she embarked on the opportunity. She mentioned that she had provided plant tours to engineering classes from a nearby private college, and during the tours she was able to showcase the plant’s operations and answer questions about how the machines function and the purpose and roles of machines and personnel within the manufacturing process. The plant tour led to students seeking internships with her company. While she noted that her company did participate in some outreach opportunities with post-secondary education, she said:

It's not a main focus for us. It just doesn't make sense for us to spend a bunch of time on it or for them to spend much time on us if we only have one position to fill every few years.

Some managers noted that they had presented at career events and in classes pertaining to the industry. Only three participants noted this connection with post-secondary education and stated that, when they attended events at their alma mater, they discussed how their alma mater trained and prepared them for their manufacturing career and how their education was utilized within their position. While Laura had not spoken at her alma mater, she had participated in education panel discussions at local institutions. She discussed what her company looked for in an employee: industry-specific skills and a particular need for machinists and welders.

4.2.1.2 Providing Internships for Administrative and Professional Roles

With the hope of gaining new ideas and providing low-cost or free experience, some business managers worked with their nearby institution and especially their alma mater to support students with internships. Internships within manufacturing provided connections between education and business where the students brought knowledge from their studies into the business and gave the business an opportunity to learn new ideas and explore options based on the new perspectives.

Manufacturing internships provided experiences for students in multiple fields and majors through special projects that also provided the opportunity to learn about the trade. Victor said he occasionally contacted the local university for student assistance with marketing and business development so the company could receive free or low cost assistance in an area where he did not have a full-time employee to fill that void. While he noted that it was not profitable to hire a full-time marketing employee, when he needs that specialty work, he has called upon college students to assist his company as they utilize their skills and provide services and materials to the company. The scenario he painted was that, in his sales meetings, the group may develop a great idea, but everyone was busy so that they could not follow through on the discussion. Therefore, Victor

started contacting the local universities for marketing interns when needed. “We'll throw it out there and if someone is interested they contact us. It's not like we're following up every week, just have to wait for the right fit.” After he had worked with interns and approved the business materials, he encouraged the students to use the created materials in their portfolios when looking for a job. He clarified that this did not mean whatever the student intern suggested was enacted within the business, but it provided both stakeholders an opportunity to explore new ideas and think outside of their everyday operations to be more efficient and effective.

Paula and other manufacturing business professionals stated they provided internships with students who approached them. Most of the time the managers did not contact the schools for assistance in hiring an intern or summer help; rather, it was the student seeking out the employer. They observed many times that their interns were students seeking an experience close to home and contacted the business manager directly. This experience provided the interns at Paula's company experience with sales, production, and client relations as she encouraged the interns to work in multiple areas within the company during their summer experience. These experiences, in Paula's view, were a way to educate the trades. She stated, “I think we should be pushing more for these programs because really that's what a job is - knowing a job.”

Participants who utilized interns suggested the interns provided free or reduced-cost help to bring in new ideas to market products, deliver a successful sales pitch to a client, assist with safety trainings, and share insight from coursework. After the internship, the students took their real-life experience with them when they applied for jobs after graduation within their field of study, which was an asset many participants noted as helpful and a positive point on a resume and in an interview.

4.2.2 Lack of Community Connections

Manufacturing business managers engaged with other manufacturing business professionals within the community but typically did not discuss business needs or successes with professionals in other fields. Being located near a training center or post-secondary institution did not aid their communication or hiring. While some participants indicated they knew and worked with other business professionals, they did not list educational leaders as key community connections. Based on the interviews, manufacturing managers did not recognize educators in their social circles or networking arenas to interact with on a regular basis to learn what was new within their sector or discuss their business needs. These participants indicated they neither spoke to each other about their services and needs nor commented that they would reach out to see how they could work with others in the community to provide programs, projects, service options, and jobs.

Over half of the participants in this study indicated they served on community boards with educational leaders but noted they rarely discussed business needs or processes to develop a more formal business relationship. The professionals who indicated involvement within the community said it was because of their personal interest not their industry. In reviewing their comments, it seemed, because others who serve on the boards did not know the manufacturing business, these professionals rarely discussed their personal education or company's employment needs with others.

Being educated, according to Clifford, allowed him to be able to deal with other educated individuals at the same level. He said,

Having those people [educated employees], they could go into another business and talk to someone else who might have similar problems, but just different products. [They could

talk about] how they relate, what they [can] learn from another business, what's worked for them, how can we implement something like that here.

In summary, the interviewees gave the impression that they felt all rural business professionals had similar employment issues, so discussing their individual concerns would lead to negativity about applicants and the lack of initiative more so than ideas for productivity and collaboration. These managers did not feel their interaction with others within their community were conducive to their business needs.

Charles was the only participant who connected his industry to community involvement. His involvement included time as an advisory board member at the vocational school and the regional bank board. He commented the bank board meetings were about interacting and networking whereas the vocational board meetings focused more on the students and needs of the program and industry. He concluded that this involvement afforded him the opportunity to get to know the program instructors, which was useful when a graduate of the program would apply for a job with his company. "I always believed in the vo-tech thing and those kids," he said because of the experience on the boards and employees hired through the program.

4.2.3 Desire for Personalized Trainings

Some of the participants indicated a need for personalized training based on their business needs. Clifford mentioned that his company worked with a local institution in the past to provide computer training to the employees. The employees went to the institution a few hours a week to learn the software that in turn assisted with how the company reported inventory, production costs, and safety. A combination of less company needs and the institution changing focus ended this training. With other skills-training opportunities offered at institutions near his company, Clifford

said, “Hopefully it will empower more than just educational classes and more skill classes.” While he did not indicate specific skill needs with this statement, he did mention sending workers to other areas for lumber grading training that could possibly be in the interest of his company if it was available nearby.

When providing personalized or direct skill and equipment training to the workers at the business, Sally was able to ensure the workers knew the machinery and understood the processes to work more effectively within the business. She noted it was important to spread the knowledge amongst everyone within the workforce, which was why she brought the trainings to the workplace so everyone could attend and learn the skills and tasks in case they shifted roles within the production facility or needed to step in when someone was not at work. Her comment was, “I think a lot of manufacturers, at least machine shops, have been some inside training. Just because exactly what you need your employee to know isn't necessarily available at a technical school.” Sally and two other participants noted on-the-job training as their preference for training to ensure the employees learn together and the company knows the information disseminated to support employees as they utilize their new skills developed through the training. It also ensures accountability for employees acquiring the information presented during the training. While this training was available onsite, it was provided through the national association Sally’s company belonged to, which also offered online courses that she could provide to her employees to learn skills and trades. However, neither of these options were specific to her company; they were based on machines or national trends. In talking about her less-skilled workers, she suggested, “In the future they could go on to a CNC and then [online options] like NTMA [offerings] that I mentioned,” to ensure they are fully trained. Other than the online option or machine training on location, she did not foresee training options in the area specific to her business needs.

4.2.3.1 Machine Training

Over half of the participants remarked that their training focused on specific machines and operations within their business. Participants specifically noted this training was coordinated when the business purchased a new piece of equipment to ensure employees understood the upgraded technology and safety aspects of the new machine. Laura related that this type of training occurred within her company when they purchased a new machine in 2017, but that purchase and training was expensive and has not paid for itself yet because they have not have enough orders and personnel to operate two shifts.

Clifford and Victor discussed that the specialized training for their employees was so specific that the seminars and trainings could not be available at many institutions. Instead, the trainings were featured throughout the year in cohorts around the country by associations and developers, and the participants' companies sent employees who needed the training to those locations. Offering such specialized trainings and certifications may not be cost-effective for a post-secondary institution to provide as it would be short-lived since technology and techniques change over time. Both Clifford and Victor mentioned that sending workers to specialized trainings limited the amount of attendees and that these offerings were sporadic because they were specialized in their field or to a specific piece of equipment. When talking about sending his employees to trainings, Clifford noted that he sends his employees to courses in Memphis. "Those skills are important to us. Only a few people need to use those skills here." The 18-week course was highly desirable and provided the employees with training and certification to understand the industry. Clifford said there were some regional classes for this training in the past but noted the training was not as informative and prestigious the one his employees attend in Memphis.

Michael said, “If you don't provide the training and education for your business, the business suffers. And when you do provide training and education, you make them [employees] much more important.” He noted that company-specific training that diversified the employees’ knowledge and skills was the best training at the time for his employees even though employees who had received that training sometimes moved on to other companies. In his view, the employees must know the machines and know the operations for production to continue as employees and for the business to succeed.

An interesting finding from the interviews was that every participant said they provided training to employees, but no one indicated employees shared their newfound knowledge with fellow workers after the employee returned from the training. The participants indicated these trainings centered on specific skills and tasks, but those who received the knowledge from the training did not pass along this information to their coworkers or managers to benefit others within the business to add to efficiency or productivity within the operation.

4.2.3.2 Business Skill Training

Post-secondary education could be more effective from the participants’ point-of-view if post-secondary institutions would learn the manufacturing needs in the region and provide opportunities for trainings. Participants noted an interest in institutions offering trainings at the business or with small groups of employees at a reasonable cost. When the cost was reasonable and did not require employees to travel, the business managers felt they were more apt to buy into the training or course offering. Again, these manufacturing supervisors did not take ownership in initiating the need or idea with educational leaders or post-secondary education institutions; they were depending on others to approach them with ideas and offerings to buy into for their employees.

These participants indicated an interest and need for more one-day or short-term course offerings about specific interest areas. The areas they indicated as training options for their employees were: leadership, new technology, new computer software, and safety measures. Charles and Clifford mentioned this with the Dale Carnegie offerings, but others indicated leadership training would aid new supervisors and assist with management promotion. Dale Carnegie courses aim to build self-confidence, as well as interpersonal, communication, and leadership skills. From Charles' experience, the Dale Carnegie courses provided personal skills and resourceful thinking. He said the company offered the course to all employees and "...was effective. It changed a lot of people's lives - personally and in the shop." He indicated the course built confidence within the employees.

Paula preferred to hire supervisors from within the organization when possible, but many times the promotion came with hesitation because the employee was unsure how to communicate and lead coworkers. She noted that formal training and post-secondary education was:

...only needed for management and even some of those people don't have degrees. It is possible move up into some roles without a degree, but historically those roles are degree people just because of the skill sets that are required to truly do the job. I think the only person in a management role [who] doesn't have a degree [are] maintenance managers and our sales manager does not have to have a kind [post-secondary education credential]. He was an operator who just happened to be really good at sales, a very personable person, so that's how we ended up [promoting him]. When you see someone with an experience that would fit, you're willing to move them up without that.

4.3 Inquiry Question #3: How Has the Rural Manufacturing Business Professional's Perception of Post-Secondary Education Changed or Evolved over Their Lifetime?

4.3.1 The Rising Cost of Education

The participants mentioned that the cost of post-secondary education increased each year, and most people cannot recoup the cost of higher education in a labor job; however, a trade or technical school post-secondary certification or training program could be beneficial and affordable to manufacturing employees. Their combined concern seemed to be that the push to obtain a four-year degree was common for traditional-aged students, but there was little or no emphasis to learn a trade for this group. These managers indicated the younger generations lacked interest in learning trade skills. Paula's belief was "We should be pushing more in technical trade and apprenticeship and those sorts of programs because really that's what a job is. And so many kids go to college and then never find a job and have loans."

Some participants believed it was the parents expecting their children to go to college, earn a degree, and be successful. As Michael explained, he had "...a high regard for education, regardless of what it is. And I think one of the mistakes we've made in our society is that we have put too much emphasis on college degrees." He expressed a belief that parents did not encourage their children, especially those who were not academically prepared, to look at the trades or learn a skill that could assist a manufacturer where jobs are frequently available and individuals can earn a decent wage right out of high school or trade school.

In her concluding thoughts of how her perception of post-secondary education had changed, Laura noted the change in emphasis. In the past, she saw a push for everyone to go to college and now:

There's a lot of places getting away from that emphasis. Not to say education is not good, it is very helpful, and it is always better to know more than less. But a lot of people aren't using their college degree.

She emphasized the push to continue on to college after high school was not like it was 10-15 years ago; she indicated a degree was important and necessary in some fields, but it was not required as much as in the past.

The professionals all noted the availability of post-secondary education options within this region. Charles mentioned there are training schools and colleges that provide a lot of opportunity for this manufacturing-rich area as well. He talked about the access to the tool and dye business and access to training, stating:

They have training over there [noting one of the larger communities in the area] like you can't believe. It's very, very precious to have the high-tech machines and instructors, everything all right there. Those are 2,800-hour courses. This isn't you know you go to a vo-tech or a little deal area, this is for real. You're running equipment that costs millions of dollars and you have instructors there that have five-star college level college training.

While every participant agreed education and training is available in the area, only one company in this study indicated it offered assistance for employees to pursue additional training and education. Another participant noted his company offered it in the past, but that employee benefit ended in the past ten years. These two participants said very few employees utilized the educational benefits, which surprised them at first; however, with the rising cost of education and the increased opportunities for overtime pay, the business managers saw why there had been a decrease in the benefit usage and interest in pursuing education overall.

Business professionals voiced concern that educated employees carried higher expectations that influenced their interest in working in rural manufacturing. Educated employees anticipated a higher salary, leadership roles, and benefits that typically exceeded the available options offered by the participants' companies. The interviews inferred that managers believed it was the student loan burden due to the increased cost of post-secondary education that heightens the expectations applicants bring to the job search. Some participants believed if employees were not able to utilize their degree fully, that deterred them from applying for a manufacturing job. Michael stated, "The business pays the individual the value of the contribution they're going to make to that organization. We decide as an organization that the economic system we're in, what that value is for that person's contribution."

Participants stated post-secondary education as a whole must look at the cost of education. The reoccurring comment was that administrative costs in education raised the price of post-secondary education, which impacts the number of people who can engage in continuing education and inhibits their cash flow after graduation to pay back the loans they incurred while in school. These professionals wanted to see post-secondary education be more affordable for everyone who chose to learn a skill, learn a trade, or earn a degree.

In addition, the participants noted there were educated employees who could not perform a job until they learned the skills of the trade. According to some participants, employees could be book smart, but, until they mastered the skills of the trade, their academic knowledge was useless. Charles said, "This book stuff is one thing to get you started, get you excited, get you going because facts help. But it's up to you personally what you decide to do with yourself. You got to push sometimes." It was understood by the participants that the employee must be able to apply their book knowledge and skills to various jobs and fields after graduation. Laura believed this because,

throughout one's life, interests and the world change; therefore, focusing on one avenue based on a degree hinders pursuing future dreams and interest. She believed degree programs needed to be flexible to adjust to the needs of the industry available where one lived or interests that alter as one matured.

Participants agreed that post-secondary education raised the cost of an employee and added to the operating cost for the business and the products. Clifford specified his view of post-secondary education changed over the years and focused his comments more to higher education. He said, "It [post-secondary education] is not necessarily what's best for the students. We have way too many colleges and campuses, and we all want to have a campus in our town. And it's gotten way too costly."

While post-secondary education may provide training and skills, not all students obtain the true experience to work on a machine or know the ins and outs of the machine. This was another reason Sally trained employees on site, because she could not expect employees to come in with all the knowledge and experience on the first day. However, even with basic knowledge and skills, educated applicants expected higher wages. The business managers perceived that degreed applicants felt they knew more than anyone else in the company, and their salary should reflect their knowledge and skill accordingly. These business professionals mentioned that no matter if the applicant had experience or not, they expected the top salary.

While manufacturing business professionals said they must forecast personnel costs when bidding job requests a year or more in advance, they also realized that labor costs could increase more than planned if they hired an educated employee. Many times, employers said they could not afford to hire above the planned starting wage, because their annual production budget was already planned. Victor noted that he believed there could be established industry standards for salary in

the future that may assist with budgeting and hiring, but that would be many years down the road even though it is in discussion now with one state association. He said,

You may get to a point where, even like with myself, I think it's a pendulum and whether or not education is seen as an absolute versus you can train someone until it comes to that point where someone starts saying you don't have this time education. It's almost like you are [going to be] forced by industry standards. They were trying in our industry where they call it by level, like a level one technician, level two technicians, etc. It's not a bad thing. So we're debating does it make us any more money right now. It's more of a thing saying, here's some standard that we expect, and because of that, it may have a benefit but that's yet to be seen.

In addition, three participants mentioned there were too many degree opportunities in post-secondary education. Their belief was the expanded options in post-secondary education watered down the applicant pool because their certifications or degrees were focused on specific items. Therefore, the applicants did not understand how to cross-reference skills in other titles or fields. This left applicants looking for specific skills and positions and not an overall fit with a multi-faceted job seen in rural manufacturing. Rural manufacturing employees had to be able to move within roles and complete multiple tasks within a day; the supervisors said employees must be versatile to adjust to multiple functions or roles within the workday. Laura's reflection of education was,

You don't know what the future is going to bring. So sometimes, I think if you prepare for it, and you lock yourself into it, and the education. You know, [many] people do not like what they do after they start doing, lives change, geography changes, and you move [so] your life changes.

She based this comment on the access to learn through multiple sources and the access to multiple focus areas within degrees. Moreover, when she hired an employee with more experience in a different software program or function area, that could influence the budget and the operation needs of a project.

Paula and Victor noted there is a cultural expectation at times to have educated employees in sales or customer relations. They said some clients and customers expected to work with educated employees even though manufacturing business professionals did not always have degreed employees as salespeople and customer service representatives. Both manufacturing managers said their sales team members were capable and knowledgeable to work with clients and customers before they went on their own to market the company and acquire sales. However, when they knew the client's expectation was to work with a degreed individual, the manufacturing business professionals met that expectation. When talking about the client and customer needs, Paula said:

We definitely cater [to the customer]. Who we send to a customer meeting is based on how that customer likes to communicate or what kind of like team they may be sending to the meeting. [For example,] if they're going to send owners or engineers or more degree people, then we make sure we have that same level. Whereas if they're more operational based, generally it's going to be some technical person. But if it's less management level or technical, then we probably wouldn't worry as much about having all the managers there.

Not every manufacturing business supervisor highlighted the importance of having degreed employees. Victor reiterated he meets the clients' needs as best as he can, but he knows even employees without degrees are capable to market the company, build client relationships, and

create sales. Several participants said, in the past knowing a product and business was fine, but now some clients and customers expected to work with degreed workers when negotiating contracts and working on projects. It seems based on what these participants claimed in the interviews that degrees were like a security blanket to the client, due to a belief that degreed employees know a lot more about business and industry because they graduated from a post-secondary institution.

4.3.2 Retaining the Younger Generation within the Region

Most participants indicated they believed educated employees leave the rural area because they have learned to be more social and gained new interests that were not available in rural areas. When talking about how the company recruits and retains employees, Clifford said,

There's some people that are going to change in five years and then they've changed another five years now. They are all of a sudden 35 or 45 [years old] and they either have to move or [do] what they can to find positions in the area.

The discussion point was that employees felt they were over-educated for the job they were performing, underpaid, or did not want to continue working in a manual labor job. This brought up another point that caused the younger generation workforce to disappear in rural manufacturing. They felt younger generations left the area to live in urban settings for more social and recreational options outside of work. Some of these social and recreational opportunities are limited in northwestern Pennsylvania. Some participants pointed out this area drained the creativity and interests of the younger generation that took them away from where they grew up because the younger generation saw the rural area as old-fashioned and not modern and attractive like urban

areas. Paula specifically mentioned rural areas needed more social and recreational options, including chain restaurants, in order to attract the younger generation of workers.

A few managers noted they had seen people leave the area after earning a degree. Clifford said some of these individuals would return to the area to raise children after a few years, but returning to the rural area meant taking a lower paying job in manufacturing until they found a better paying job or a job within their field of study. He said these were usually hardworking individuals whom manufacturing business supervisors train, but they do not stay with the company because they use the position as a stepping stone to a more attractive, higher paying, or more focused job within their field within a short period of time. Speaking about retaining educated employees, Clifford stated, “We have [degreed or educated] people here working because they can't find jobs. They're just looking for something to cover before find something else. But hopefully we can [see] from their resumes [to identify] a potential leader”. His concern was that the employee saw the lower wage making them less valuable instead of looking at the cost of living in the rural area to the actual earned wage. In addition, he concluded the educated employee looked for promotion opportunities, and those were limited in rural manufacturing. Clifford alleged:

To bring businesses back, we need people who like to hunt fish and everything. It is a great place to raise families to but it is hard to beat Pittsburgh. The younger generation seems to want to go [to the] big city.

Many participants indicated the increasing age of manufacturing employees and noted that attracting younger workers would be crucial to continue their operations in rural areas.

While many assumed it is common sense, many interviewees emphasized the need to find workers who were not dependent on drugs or alcohol or who had a criminal background in their

interviews. The business professionals insinuated it was the younger workers who brought criminal records and negative backgrounds to the industry. Howard clarified:

There are decisions that you make today that impact your ability to work here, for example, you know, you can't go out and get a felony when you're 18 and expect me to hire you when you're 20. We really do drug test here. And we will absolutely not hire you if you fail a drug test. You know, those are decisions that people make, that can impact their ability to earn in the future.

However, Paula's viewpoint was what an employee did on their personal time was their prerogative. That was why the company did not conduct drug screenings for employment or periodically to employees. She indicated the company did not complete pre-employment drug screenings because,

I can guarantee you, we would have workers not pass. We know that as long as you're safe at work, we can't really control their personal choices. And if we did drug tests, we'd be hard pressed to find people.

However, she did indicate that if there were a safety concern regarding drug or alcohol use, the company would look at options to ensure the safety of their personnel and business. Therefore, was there was no cut-and-dry perception on how an employee's personal interests affects their employability from these participants' point-of-view.

5.0 Conclusion and Implications

The purpose of this study was to understand rural manufacturing professionals' perceptions of post-secondary education using interviews. These interviews revealed that most managers did not see trainings and certifications after high school as post-secondary education even though they desired their employees to possess the skills and knowledge of machining. Instead, most manufacturing managers related post-secondary education to a college degree, which they did not see as essential in manufacturing. In the end, manufacturers desired skills over post-secondary education and emphasized that the professional skills, along with personal traits, described in the prior chapter were essential for employment within the manufacturing industry.

5.1 Summary

Rural manufacturing professionals focused on the practical needs of their manufacturing and machining workforce, which in turn indicated what role post-secondary education needed to play in preparing employees for these roles. The need for post-secondary education was skill-based rather than degree-based, because the industry did not require employees to have degrees. Trainings and certifications were essential for employees to maximize their role within the industry. Similar to Ahmad (2017), this study found that in rural manufacturing employers look for an applicant who has not earned a degree but possesses the skillset required to fill the role. These managers sought employees who possessed math skills and some machine training, which they expected to be part of training and certification programs. This finding supports Carnevale

and Smith's (2013) concern about the growing need for general skills, including communication, manners, reasoning, and basic problem-solving more than specific academic and vocational skills.

Participants in this study indicated they looked at skills and experience more than grades on a transcript from a school. Skills and experience seem to be missing in today's general workforce (Busteed & Seymour, 2015), which explains why a low percentage of business executives saw their business needs met in the skills and competencies of college graduates. These participants believed applicants lacked communication skills; therefore, the supervisors focused on the applicants' trade skills and ability during the hiring process. Participants agreed that, although they expected to hire well-rounded and competent employees, they may need to address teamwork and communication once the employees were hired so that generational interactions among co-workers and supervisors was effective (Gibbs, 1998).

Bauch (2001) found that rural communities needed to collaborate across sectors and industries to serve their citizens. However, the participants in this study said they did not talk with educators or other business professionals outside of their industry. They felt that only other manufacturers shared their challenges and needs. Unfortunately, the manufacturing professionals did not feel educators would relate to or address the specific workforce concerns faced within the manufacturing sector. Therefore, while these managers expected their employees to communicate amongst themselves, they themselves did not communicate with others who could support and boost their business needs. The managers neither said they should seek skill development of manufacturing employees, nor was there a direct plea for post-secondary educators to approach the businesses for information to ensure local workforce needs were being met.

Kasper (2003) and Miller and Tuttle (2006) believed communication and collaboration were important in rural communities. Companies are better able to retain personnel and future

business development can be aided through local partnerships and connections. The participants in this study sought local training options from others they were familiar with in the industry before they looked to post-secondary educators or institutions that could share their knowledge. When credentials and skills are provided locally, businesses and industries are more apt to stay in the local area because they: (a) can be assured their employees know what is needed to complete the tasks required, and (b) are willing to stay local (Miller & Tuttle, 2006; Schafft, 2016). Some participants indicated they did not seek training and education locally, because there was no local training opportunities to fulfill the specific needs they had. Therefore, while the managers reported that there were local educational options, those options were not meeting manufacturing workforce needs.

Moreover, opening the lines of communication connects business and education leaders to discuss employer needs and potential program offerings in rural areas. Currently, there is a lack of communication between the business professionals included in this study and post-secondary educators in Northwest Pennsylvania. While the participants hinted that they were interested in trainings and programs for their employees, they had not reached out to nearby centers and institutions to coordinate training programs for their workers. Therefore, moving forward the business sector needs to address the lack of external communication and start collaborating. After reading the literature and listening to these participants, it became clear that another way to increase communication between manufacturing professionals and post-secondary educators would be to include business professionals in education discussions. While one manager indicated he sat at the table and disseminated industry challenges to educators in the past, most manufacturing professionals have not been included in discussions regarding the development of additional trainings, certifications, and programs that affect manufacturing.

In summary, rural manufacturing business managers looked to post-secondary education for skill development. Employees seeking to enter the manufacturing field needed to possess trade, communication, and math skills and be able to understand technology. These managers looked for experience to aid employee skills. However, the professionals did not openly communicate these needs with educational leaders, so manufacturer expectations were not passed along until someone approached the manufacturers directly about their business needs and challenges. The one exception was manufacturing professionals who connected with institutions where their employees received training and earned degrees. Those degreed employers indicated that they associated with their alma mater and occasionally would offer skills-training through internships for students from other institutions to talk about their business, how education and business intertwined, and their field experience. As the managers alluded to the aging manufacturing workforce, they noted concerns with recruiting and retaining younger workers. Since the cost of attending post-secondary education has continued to increase, graduates of these institutions expect top wages or leadership roles quickly without demonstrating their knowledge and ability in order to recoup the costs of pursuing post-secondary education. These realities highlight a significant concern for the manufacturing industry as managers seek to sustain their businesses. Post-secondary education was a skills-based focus not degree-based in the eyes of these eight participants.

5.2 Relation to Bailly's Framework

Bailly's (2008) framework provides a visual of how perceptions and requirements evolved as manufacturing business supervisors hired and supervised workers. Through the interviews, it became clear that employers did not necessarily change their hiring processes but did alter

expectations and requirements of employees. They based these changes on their experiences with employees and the institutions from which credentials were earned. Intended and unintended factors altered or confirmed their beliefs in how they recruited employees and their expectations for the employees.

The framework was useful in the way it displayed how intended and unintended performance factors swayed the decisions into what skills employees needed in the various roles within the company. This brings competencies into the discussions about communication and teamwork between employees as well as the use and understanding of technology. Furthermore, the framework displayed that the managers held preconceived thoughts of what they looked for in the new hires, the expectations of the employees, and how their thoughts worked or needed to be adjusted for the next hiring event.

Employee tasks have not changed as much as the expectation for understanding their role in the business and their role in the manufacturing process (Stark & Poppler, 2016). Employers addressed their needs and progress through their interactions with the employees. Based on the employee's skill level and performance, the business manager's perception of the post-secondary education institution could change. These business professionals spoke about their alma maters and institutions they knew first-hand but alluded there were other programs available in the region. However, the business professionals did not have employees who studied at those institutions and, thus, did not have a local connection to those institutions. These supervisors expected employees to share their knowledge and training with others around them and to assist in making operations more efficient. One intended factor that did not change over time was that employers expected their workers to work as a team and communicate with others within the company. It did not matter what the employee's background was or where they worked within the company, they had to be

willing and able to communicate with other employees about their needs and thoughts to be more efficient in business processes.

One area where the intended employee performance changed was understanding technology. The managers' concern was that newer machines had more advanced technology, and the aging workforce did not know and understand all the functions and features. This, in turn, required the business to find additional training opportunities for long-time employees to learn the new machines. Managers saw the need for technology to be successful and believed the younger generations brought the updated skills and desire to utilize technology in the business.

Managers were concerned they could not retain employees as they could previously, because the younger generations tended not to stay in roles for extended periods. That was a change from the past industry standards where many employees stayed within the business or at least within the industry until they retired. It will take a few years to know if adding a manufacturing and machining program within 30 miles of all these participating businesses will encourage the younger generations to stay in a manufacturing career in the area.

While this framework was a general guide, it aided in mapping the connections between employer expectations and changes based on the available workforce. Doing so proved the need for communication between rural manufacturing business professionals and educators to build the skillsets within the region and meet the workforce needs.

5.3 Implications for Practice

The lines of communication need to be opened between educators and employers. Educators need to talk with employers to learn what skills and programs are needed to best serve

the workforce within the area. They should also think about opportunities to bring manufacturing leaders into classroom discussions to discuss education and skills needed to enter the workforce. Similarly, institutions need to look for opportunities to bring business professionals onto advisory boards to address the workforce needs with administrators and build a town-gown relationship with between the two sectors to best serve the region and its citizens. Educators must take the lead to initiate this step.

Based on the finding that participants did not interact and communicate with educational leaders, it is imperative moving forward to include business professionals in discussions regarding future manufacturing and machining program offerings. By maintaining open communication, there are additional opportunities for growing programs, enrollment, and job placement. Business professionals should share their needs through discussions with educators to decipher industry standards as well as communicate local needs of employers and employees. Once programs are in place, educators should share enrollment dates and course times with employers so they may refer employees for additional skills training and promote programs to increase enrollment at local institutions. Students who are not currently employed will become more appealing as potential hires since employers will better understand the preparation provided by educational institutions. By following Galston and Baehler's (1995) suggestions, communication can increase the opportunities for the workforce and improve educational options when institutions respond to the businesses already operating. Therefore, there are more options for everyone if these two sectors work together to promote industry, skills, and education. In order to share perspectives and understand required employment skills, education leaders need to be inclusive with business partners as programs develop.

The participants in this study noted the challenge of recruiting and retaining the younger generations. Including manufacturing businesses in job fairs and recruitment events could benefit the students and employers. Job fairs bring business professionals on to campus, which is a perfect opportunity to visit labs and other centers to gain insight into the educational process. During the fairs, students and community members interact, which is also a recruiting opportunity for the post-secondary education institution to garner interest in programs and trainings for others who are looking to pursue education. These fairs also provide students and attendees an opportunity to learn about the local workforce needs and the job openings in the rural area.

Post-secondary education institutions must not forget to market to and recruit from, technical and career training schools. Students at these schools learn the basic skillsets to enter their vocation; however, they may be interested in gaining additional knowledge before entering the workforce. Many regional technical and career training schools offer courses to high school students during the day and adult learners at night; therefore, post-secondary education institutions must market their programs to both age groups. There can be no assumption that once a student completes a technical or career training program that they will transition into the workforce. Graduates may choose to pursue additional skills and knowledge to elevate their understanding in a field by enrolling in additional post-secondary education programs.

When developing a program, it is important to provide stackable courses that build knowledge and skills over time. Manufacturers indicated that they needed employees with basic skills such as math, machine safety, and machine functions. They also noted a need for advanced machinists and operators. As employees complete stackable training, there may be options to move into more advanced technique courses about cutting styles and setting machine speeds. Curriculum designers need to develop courses that employees and students can complete in segments and that

not require simultaneous enrollment. This will spread out the enrollment and assist manufacturers with their workforce development.

Institutions need to provide evening programs for working community members wanting to learn a workforce skill. Varying the time courses and trainings are delivered allows for more people to enroll and gain the skillset needed for the jobs in the area. Moreover, if business managers agree, those workers may be able to alter overtime requirements or adjust starting or ending work hours to ensure they can be in class to learn the trade needed with that company. Consequently, communicating available education opportunities to workers including courses and delivery times is another reason to market to rural manufacturers.

Currently, the rural professionals in this study said they sent employees out of the area for training, or they brought in someone from a national organization to expand employees' knowledge. This is symptomatic with the lack of communication with educational leaders. Post-secondary education must develop workforce training programs that meet business needs in the region. These programs can be administered at the institution or at the business site if necessary. Employers seek professional development opportunities that will build self-confidence and safety within the workplace. One way institutions can market these program options is to work with educators to develop a list of potential seminars and topics they can deliver to workers. Educators can share their experiences and knowledge with workers about machinery or about ways to advance their skills. Some of the focus areas on the potential workshop list could include safety measures, skill-refreshers, or other challenges managers see that need to be addressed. Skill-refreshers would include understanding the company's computer software, leadership skills, and teambuilding. There may also be an opportunity for post-secondary education institutions to

provide math classes to manufacturers to refresh skills. As new machinery is introduced into manufacturing, it would be ideal if curriculum designers would include these *new* skills.

5.4 Implications for Research

Based on this study's findings, the next step toward continuing this line of research and understanding the educational needs of the manufacturing industry is to speak with employees to glean their perspectives on how post-secondary education might assist with their job. Hearing from the employees would provide additional viewpoints on the employment and technical skills needed in manufacturing. Employees' input would determine the frequency with which they use specific skills and what trainings they perceive as important in their role.

Furthermore, managers noted that educated workers expected more money and advanced roles within manufacturing. Therefore, research is needed to determine if employees who are expanding their skills and knowledge also feel this way. Learning about employees' expectations would supplement the managers' beliefs about how post-secondary education affects educated employees' expectations for a career in the manufacturing industry including: career advancement, guaranteed increased income, assistance when changing careers, and other perceived benefits or entitlements.

In addition, I would like to survey or interview post-secondary educators and administrators to see how they determine course and program offerings to develop trainings and programs that ensure graduates have employment opportunities after graduation. Learning the educator's thoughts and perspectives may prove highly beneficial in future research now that this study established a base knowledge of rural manufacturing employer's perceptions. In this study

there did not appear to be any solid relationships with nearby institutions that would allow employers to feel connected to or to seek applicants from those institutions. Gathering input from nearby employers on their business needs would inform the institution's view of how the employment opportunities dictate post-secondary programs and potential enrollment.

Finally, educators must consider the negative connotation post-secondary education sometimes has within the manufacturing industry and within rural communities. Interested researchers can study how managers and employers perceive education impacting work in rural communities, specifically if these stakeholders believe that education helps or hinders an employee's focus and the connection between education and workplace safety and productivity.

5.5 Demonstration of Excellence

Nearly two months after collecting the data for this dissertation, I started a new position and now work with an institution committed to meeting workforce needs. Information gathered from this study was shared with educational leaders to discuss manufacturing employer needs within the region, which progressed to planning aspects for course and program offerings. In addition, some information was included in two grant applications about the need for basic machining and CNC machining courses within the area. While machining and manufacturing are slim segments of this institution's plan, some of the information garnered through the interviews portrayed the need for increasing communication and building relationships within the community and educational institutions.

Based on my recruitment of potential study participants, I was able to provide a list of potential professionals who might have been willing to discuss their workforce and business needs

with the institution's administration to develop programs that train and build skillsets in workers. Noting the need for increased communication, everyone on the manufacturer employee list that generated as part of this study, including those who did not meet the criteria for this study, received a request to meet and discuss their business's skill and training needs with the curriculum designers in mid-September. No one in that meeting participated in this study; however, the employers in the meeting indicated similar needs as those in this study. They reiterated the need for skilled machinists, dedicated employees who arrive to work on time, and employees with the ability to compute basic math and understand fractions. This anecdotal data supports Bauch's (2001) findings that rural communities needed to collaborate in order to serve their citizens; institutions must work with their regional businesses and agencies to offer programs to support the students and prepare them for the workforce. In the 1991 study by the Commission on Small/Rural Community Colleges, Valadez and Killacky (1995) referenced employer and educator collaboration to address social issues and provide workforce training to employees. Their work concluded that while manufacturing and labor jobs in the southern United States did not need post-secondary education in the past, there would be a need to collaborate in the future to develop relationships that support workforce needs.

Research indicated the need for educator and business professionals to build relationships. Due to my research and insight from this study, I was able to understand some of the industry language local manufacturers used in meetings. While I did not know every machine or its purpose, I was able to relate the functionality of the machine and its name to what the employers mentioned. In the study and meetings, there was a concern that the equipment used in courses and program offerings complement what these rural employers utilize in their operations to what is available in the area. Talking about machinery already in place locally and the required machine skills will

help align the technology and requirements for future courses and trainings. In addition, several employers indicated an interest and ability to provide internships and hands-on experience with students who enroll in new programs once developed. One company stated its willingness to provide equipment and supplies for new programs as a form of support for basic machining in the rural community. This supports what Gibbs et. al (1998) expressed as the need for local educational institutions and employers to work together to ensure the workforce needs are met through trainings, certifications, continuing education, and degrees to expand the skills and knowledge of the workforce.

As trainings and programs are developed, information will be shared with the supervisors in this study so they can encourage employees who would benefit from these post-secondary courses. Having the background through this study helped develop the manufacturing manager contact list for future internship and apprenticeship sites, advisory board leadership names, and potential employers for graduates of the program. All the professionals in this study were included in a planning and organizational meeting for the general and precision manufacturing program at the institution. Manufacturing business managers wait in the wings for trainings and programs. However, until there is communication between educational institutions and manufacturers, those needs and skills may not be available. Once the two entities interact, courses and programs could be available to ensure the education and skill trainings meet the needs for graduates to step into the workforce.

As my new career evolves and I develop additional insights and relationships with manufacturers and educators providing manufacturing training, my goal is to share the findings of this study and further research in an interactive breakout session to participants who are eager to learn about how manufacturing and education intertwine at the region's Manufacturing Day event.

This annual event draws over 2,000 students, educators, administrators, and industry advocates together to learn about manufacturing in northwestern Pennsylvania.

5.6 Conclusion

While this study was conducted to understand rural manufacturing professionals' views of post-secondary education, it opened the doors for additional discussions and opportunities to expand dialogue with local business professionals about course offerings at a rural northwestern Pennsylvania institution. After listening to the manufacturing business professionals in this study, it became clear that they all faced similar workforce challenges and sought equivalent skillsets to aid their production. The focus on the need for skills and experience more than degrees and knowing the functions and operations was what increased production within manufacturing. Managers sought applicants who had the knowledge, skillset, and commitment to complete the required task.

The Problem of Practice for this study was to understand the rural manufacturing managers' perceptions of post-secondary education. This study showed a need for skills training as well as math and computer knowledge in manufacturing. Post-secondary education institutions in northwestern Pennsylvania, therefore, need to market these trainings and courses to manufacturing companies who can encourage their employees to expand their knowledge in these areas. While costs impact the ability to provide training and development sessions, the ability to provide options for groups at the business, or nearby, could be an incentive for business managers to provide these options to their employees. Local trainings save the companies money on travel and increase the number of employees who attend. This all begins with the educational leaders

developing a workforce development plan and communicating the opportunities to the local businesses, which increases revenue to the institution and saves the company money while training more people simultaneously.

The first step for collaborating and understanding is for post-secondary education institutions to talk with business professionals about workforce needs. Once the educational leaders know what skillsets and knowledge are needed in the regional workforce, they can develop a list of seminars and trainings for local businesses to provide their workers. Post-secondary education institutions need to communicate their workforce training options to businesses in the region. These sessions can open doors for additional short-term trainings with businesses and could also open the door for workers to enroll in classes at nearby institutions.

Implementation of recommendations and plans may take further discussion and cooperative agreements, but knowing the needs of the rural manufacturing business professionals has already started the discussions and attracted more voices to the table to develop trade skill trainings and certifications in the near future within 30 miles of all the participants' businesses. This study reported the desired skillsets of manufacturing employees and found that these supported existing findings in the literature on future workforce development and job placement in the region. In addition, it drew attention to the fact the supervisors needed to voice their challenges and needs with educators to address the skill shortages in the area.

Participants made it clear that they sought skills and experience over degrees when hiring. The barrier to finding these workers began with the lack of communication between business professionals and educators about the challenges and needs. The researcher's conclusion was that post-secondary educators must conduct discussions with business professionals to find ways to expand educational offerings and aid worker knowledge and skills. It is up to the educational

leaders to be assertive in finding the workforce skills gaps and developing programs to best serve the workforce needs in northwestern Pennsylvania. Without the outreach to determine the needs and requirements in the workforce, programs and trainings cannot be developed, because the business professionals are unlikely to bring their needs to the post-secondary education institutions.

Post-secondary education can contribute to the vitality of the rural area by adapting to the workforce needs in the region when providing certifications and degrees related to the businesses in the area. Ensuring the knowledge and skillsets learned in post-secondary education will be utilized in their career assists with recruitment and retention of students and employment of graduates. These institutions must communicate program offerings through outreach activities where potential students, parents, and employers can learn about the requirements and opportunities available with the completed certification or degree. It is up to the institution to disseminate training and program information; the institution is responsible for marketing programs to ensure their success.

This study serves as the foundation to develop more dynamic manufacturing workforce training programs in northwestern Pennsylvania. Once the institution develops a program and creates the marketing tools, educational leaders can then communicate with others about the program. Communication must include the program goals, course topics, required materials and safety gear needed, and the course overview of the time commitment for students. The participants of this study and other manufacturing business managers should receive machining and manufacturing program information to disseminate the opportunity to those employees the companies wish to see engage in additional learning to better themselves as well as to grow business operations.

Appendix A Recruitment Letter/Email

Hello <NAME>,

My name is Stephanie Fiely and I am a doctoral student at the University of Pittsburgh conducting research on the rural business managers' perception of post-secondary education. This research is being conducted with rural manufacturing business managers in northwestern Pennsylvania.

Because your manufacturing business is located within 30 miles of a post-secondary educational institution, I invite you to participate in this study. The intent of this study is to learn how rural manufacturing business managers perceive post-secondary education. There will be no direct reference to you or your business by name in the final dissertation, but the information collected will assist with my understanding of how post-secondary education impacts business in northwestern Pennsylvania.

The interviews will take place at your place of business. Interviews are expected to last 30-45 minutes at a mutually convenient time so that it is not impacting your operations and business needs.

All data received from you will be given an ID# or pseudonym so you and your business will not be directly identified. All stored data will have this number on it and not your real name. Your responses are confidential, and data will be kept under locked and password protected. I will not associate the information you provide with your name in reports but it may be possible for someone to think they can identify you. Data will be shared with the defense committee as needed, however no identifying information will be shared. Findings will be reported overall in the

dissertation. If future collaborations on this topic is desired, the de-identified data may be shared with those in the collaborative research at that time.

There will be no compensation for being interviewed and participating in the research.

This study has a low level of risk. The study provides the participants the opportunity to express their views of post-secondary education. Your participation in this interview is voluntary, you can stop the interview at any time or choose to not answer a question at any point. Should a participant withdraw from the study, your data will not be transcribed and will not be analyzed by the transcriptionist or researcher. This will ensure that the data is not reviewed when presenting the data in the dissertation. If only a specific question or questions are refused, those will just be noted in the transcription as not answered so the other data can be utilized, but that the data for that specific question is not swayed by the number of responses or how it is/is not answered.

The interviews will be transcribed by me and an outside transcriptionist who will be preparing the written data which I will then review for the analytic memos and analysis. There will be no identifying data given to the transcriptionist, except if the interviewee would mention their name or company in an answer to a question.

Within the next two weeks, I will contact you via telephone as a follow up to obtain your interest and availability to participate in this research study. If you have any questions in the meantime or would like to schedule your interview sooner, please feel free to contact me at 814-350-5846 or stthomas@pitt.edu.

I look forward to hearing from you regarding your participation in this research study.

Sincerely,

Stephanie Fiely

Appendix B Script/Interview Questions

Interview Questions

I would first like to gather some information about your business and leadership.

1. What trainings and degrees have you earned since graduating high school?
2. How would you describe your business?
 - a. How long has it been in business?
 - b. What are the future plans for the business?
3. How long have you been the manager or supervisor of this business?

Now I would like to learn about your perception of post-secondary education. Perception is defined as your understanding. For this study, post-secondary education is defined as any certificate or degree program after high school.

4. What role does post-secondary education play in your business?
 - a. What type of post-secondary education requirements do your employees need to function in their job?
 - b. How are job requirements such as trainings, certifications, and education communicated with your applicants and employees?
 - c. What role does post-secondary education play in ensuring your employees have the proper skills and training?
 - d. What challenges or barriers does your business have with these post-secondary educational needs?

- e. How does an employee's individual post-secondary education experience impact how you communicate or relate to them personally?
 - f. How does a post-secondary education degree impact how you relate and communication with other professionals and business leaders?
5. Among the positions at your business, what levels of education are needed for the various roles?
- a. How have you worked with local education institutions to address your business needs?
 - b. How did you establish these local, regional, or national connections with colleges and universities?
 - c. What post-secondary educational trainings, programs, and/or services are missing in the area that would assist your employees and business development?
6. How has your perception of post-secondary education changed or evolved over your lifetime?
- a. How does your personal training or education impact your thoughts?
 - b. How has someone else's personal educational achievement in your business or field impacted your perception of post-secondary education?
 - c. In what ways does an employee's education credentials impact your perception of post-secondary education? What about your perception of the institution where that employee earned their degree?

- d. How has your proximity to post-secondary education impacted your perception of people completing additional training and educational opportunities?
- e. How do you foresee any changes in your perception of education in the future?

Is there any additional information you would like to share with me today that I did not specifically inquire about in our interview regarding how you perceive post-secondary education?

Closing

I want to thank you for taking the time to talk with me today and share your perspective. After your interview is transcribed, I will send an analytic memo summarizing your comments from this interview for you to review. When you receive this information you may update or correct aspects you need to clarify your thoughts to ensure the information is coded based on your personal perceptions.

Thank you again for your participation in my research study. Should you have any questions at a later time about this interview or if you would like to add any additional comments, please feel free to contact me at 814-350-5846 or stthomas@pitt.edu.

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