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Strategies to Recruit Skilled Workers in Manufacturing

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Walden University

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Walden University

College of Management and Technology

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Ina R. Rawlinson

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Walden University
2019

Abstract

Strategies to Recruit Skilled Workers in Manufacturing

by

Ina R. Rawlinson

MPA, University of Oklahoma, 1991

BS, University of Maryland, 1988

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

March 2019

Abstract

Manufacturing hiring managers in the United States who fail to implement adequate recruitment strategies for skilled production workers experience reduced profits and sustainability challenges. The purpose of this multiple case study was to explore the strategies that successful manufacturing hiring managers in North Carolina used to recruit skilled production workers to sustain business profitability. Inductive analysis was guided by the human capital theory, and trustworthiness of interpretations was strengthened by member checking. The population for the study consisted of 4 business leaders who demonstrated the use of effective recruitment strategies to sustain profitability in manufacturing businesses in southeastern North Carolina. Data were collected from face-to-face interviews with the leaders and review of artifacts pertaining to employee recruitment strategies. Six themes emerged: fueling competition for local labor market, enhancing advertising methods, networking, providing job training, growing talent, and building new perceptions of manufacturing. The application of the findings from this study could contribute to positive social change by providing manufacturing business leaders with effective strategies for recruiting skilled workers. Business leaders could contribute to positive social change by increasing workplace stability and employees' abilities to support their families. Businesses and individuals could benefit from improved standards of living, thereby contributing to the sustainment and prosperity of communities.

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Dedication

I dedicate this doctoral study to Mrs. Bertie A. Sanders, Mrs. Patsy H. Suggs, Mr. George E. Vick, Jr. (Bud), and my mother, Mrs. Ella Mae Brayboy Dawson for all each of you have taught me in life.

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Table of Contents

List of Tables iv

Section 1: Foundation of the Study 1

Background of the Problem 1

Problem Statement 2

Purpose Statement 2

Nature of the Study 3

Research Question 5

Interview Questions 5

Conceptual Framework 5

Operational Definitions 6

Assumptions, Limitations, and Delimitations 7

Assumptions 7

Limitations 8

Delimitations 8

Significance of the Study 9

Contribution to Business Practice 9

Implications for Social Change 10

A Review of the Professional and Academic Literature 10

Theory of Human Capital 11

Human Capital Theory 14

Context-Emergent Turnover Theory: A Theory of Collective Turnover 22

Intellectual Capital … 23
Shortages in Manufacturing 25
Talent Gap 26
Skills Gap 28
Recruitment Challenges 30
Relevance of Manufacturing 32
Technological Changes 38
The Business Impact 40
Aligning with Industry and Employee Need 43
Transition 46
Section 2: The Project 48
Purpose Statement 48
Role of the Researcher 49
Participants 50
Research Method and Design 51
Research Method 51
Research Design 52
Population and Sampling 53
Ethical Research 54
Data Collection Instruments 56
Data Collection Technique 57
Data Organization Techniques 59

Data Analysis 59
Reliability and Validity 61
Reliability 61
Validity 61
Transition and Summary 63
Section 3: Application to Professional Practice and Implications for Change 64
Introduction 64
Presentation of the Findings 65
Applications to Professional Practice 79
Implications for Social Change 80
Recommendations for Action 81
Recommendations for Further Research 82
Reflections 83
Conclusion 84
References 85
Appendix A: Interview Protocol 106
Appendix B: Interview Questions 107

List of Tables

Table 1. Theme 1: Fuel Competition for Local Labor Market 65

Table 2. Theme 2: Enhanced Advertising Methods.....70

Table 3. Theme 3: Growing Their Own Talent 76

Table 4. Theme 6: Building New Perceptions of Manufacturing.....78

Section 1: Foundation of the Study

Baby boomers are individuals born between 1946 and 1964. With baby boomers retiring and exiting the workforce, industrial employers are facing difficulty recruiting qualified workers (Sumbal, Tsui, See-to, & Barendrecht, 2017). The lack of available skilled industrial maintenance and automation production workers has a detrimental economic impact on U.S. manufacturing and threatens corporate growth and global competitiveness (McDonough, 2017). The goal of this study was to explore the strategies used by manufacturing hiring managers to recruit skilled employees to sustain business profitability.

Background of the Problem

Manufacturing hiring managers often experience shortages of qualified job applicants to fill vacant positions. According to the Strayer @Work Skills Index, the skills employers require and what skills job applicants possess are different (as cited in McDonough, 2017). Employers face significant challenges with the uncertainty of talent shortages in organizations and a gap between the skills possessed by applicants and the skills needed in organizations (Makarius & Srinivasan, 2017). As of 2014, 23% of the total workforce in the United States was employed in skilled technical positions, performing tasks critical to innovation and the economic growth of organizations (Rothwell, 2016). Human capital is essential to organizational growth and lessens the likelihood of business failure (Goedhuys & Sleuwaegen, 2016). Researchers have found that firms with high levels of research and development human capital are better positioned to survive business failure during a global financial crisis (Martinez, Zouaghi,

Marco, & Robinson, 2018). Businesses will have nearly 3.5 million manufacturing jobs open in the next 10 years, and 2 million may remain unfilled due to a shortage of workers (Anid, 2018). Nearly 9% of workers in the United States are employed in manufacturing, which supports research and development providing technological advances and continuing innovation for industries (Anid, 2018). As Baby Boomers continue retiring between the years 2014 through 2024, the labor market will likely grow more competitive (McDonough, 2017).

Problem Statement

Manufacturing business leaders are unable to recruit skilled production workers to replace the retiring Baby Boomers and remain competitive, which threatens company growth and global competitiveness (McDonough, 2017). A 2015 study by Deloitte and the Manufacturing Institute stated that manufacturers will need 3.5 million new workers in the next 10 years to replace retiring Baby Boomers (as cited in Anid, 2018). Massachusetts and other states in the United States have reported a shortage of robotics operators, programmers, quality assurance personnel, and other skilled workers to fill advanced manufacturing positions (Zeid, Bogard, Javdekar, & Duggan, 2016). The general business problem is that businesses can incur lost profits and reduced sustainability from failures to recruit skilled production workers. The specific business problem is that some managers of manufacturing companies lack strategies to recruit skilled production workers to sustain business profitability.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies that hiring managers of manufacturing companies used to recruit skilled production workers to sustain business profitability. The population for this study included hiring managers from three manufacturing companies located in southeastern North Carolina who successfully recruited production workers who have the skills necessary to sustain business profitability. The implications for positive social change include the potential to provide business leaders with successful strategies to acquire skilled laborers to ensure the viability of community businesses. The contribution to social change will be to help hiring managers understand how to design and implement systematic approaches to recruiting skilled workers, which might help to ensure appropriate job opportunities in manufacturing for skilled workers, increase business productivity and profitability, and support of economic development and prosperity in southeastern North Carolina.

Nature of the Study

Researchers select between quantitative, qualitative, and mixed methods approaches to conduct research (Levitt et al., 2018). Qualitative researchers seek to understand the process regarding the phenomena under study (Al Marzooqi, 2015). By using interviews and observations, qualitative researchers obtain facts and provide comprehensive knowledge about the phenomena under scrutiny (Annansingh & Howell, 2016). The qualitative method was appropriate for this study as my intent was to gather narrative rather than statistical data to explore the business problem. Quantitative researchers use data from survey instruments and experimental investigations to test

hypotheses and analyze cause-and-effect relationships among variables (Annansingh & Howell, 2016). Quantitative researchers analyze numerical data and present results as statistics and graphs (Al Marzooqi, 2015). I did not select the quantitative method as I was not interested in seeking how much of a phenomenon exists; rather my intent was to learn from decision making processes through interviews. Researchers use the mixed method to combine analysis and quantitative and qualitative data-collection techniques (Annansingh & Howell, 2016). To explore the strategies that hiring managers use to acquire skilled workers, I did not test hypotheses, which is appropriate in the quantitative method and the quantitative portion of a mixed method study; therefore, I chose neither the quantitative method nor the mixed method for this study. The qualitative research methodology was appropriate for this study.

The three qualitative research designs I considered using included (a) ethnography, (b) phenomenology, and (c) case study. Ethnographic researchers seek to understand people and cultures (Al Marzooqi, 2015). The ethnographic design was not appropriate because culture was not the only area I explored for this study. Phenomenologists focus on participants' interpretations of lived experiences, which was not my intention in this study (see Annansingh & Howell, 2016; Tight, 2016). Aczel (2015) noted that case study design is used to explain a circumstance and investigate firsthand phenomena in real-life settings. The case study researcher seeks to incorporate a comprehensive method using several data collection techniques and analytical approaches to answer *what* and *how* questions regarding phenomena (Aczel, 2015). The multiple case study was appropriate for the study. I conducted semistructured interviews

and company document reviews in multiple organizations to understand the phenomenon. A case study design was appropriate to explore strategies in recruiting skilled production workers.

Research Question

The central research question was as follows: What strategies do some managers of manufacturing companies use to recruit skilled production workers to sustain business profitability?

Interview Questions

1. What challenges had hiring managers in manufacturing companies experienced in recruiting skilled production workers?
2. What were manufacturing hiring managers' internal recruitment strategies?
3. What were manufacturing hiring managers' external recruitment strategies?
4. What skilled labor positions had hiring managers in manufacturing companies found most difficult to fill?
5. How did the recruitment of skilled workers affect profitability?
6. What additional information did hiring managers in manufacturing companies share regarding recruitment strategies?

Conceptual Framework

Human capital, as mentioned by Sweetland (1996), comprised the conceptual framework for this study. Becker presented the theory in 1962 and defined human capital as the knowledge, information, ideas, and skills of individuals. The principles of the theory include that (a) education and training are critical to the economic power of a

country, (b) education increases the productivity of workers, and (c) the productivity differences and earnings among individuals correlate with the investment in man (Minica, 2011; Tan, 2014). In this study, I identified effective strategies that some hiring managers of manufacturing companies used to recruit skilled production workers to sustain business profitability. I applied the human capital theory to analyze the strategies used to recruit manufacturing workers. Human capital theorists infer that investment in training and education increases the prosperity of the organization, society, and the employee (Sweetland, 1996). The human capital theory provided a lens for exploring the solutions to the business problem. In this case, the specific business problem was that some managers of manufacturing companies lacked strategies to recruit skilled production workers to sustain business profitability. Human capital is linked with economic growth at the macroeconomic level (Čiutienė & Railaitė, 2015) and is critical to the productivity of a nation (Sweetland, 1996). I applied the human capital theory to this study because human capital adds value to the organization and is a source of sustained competitive advantage (Čiutienė & Railaitė, 2015; Coff & Raffiee, 2015).

Operational Definitions

Employability skills: Employment skills are basic, central abilities and expertise or characteristics and qualities required of an employer (Asonitou, 2015).

Human capital: Human capital is knowledge, competency, creativity, experience, education, loyalty, innovation, problem solving abilities, and work and life attitudes that productively add value to the organization (Čiutienė & Railaitė, 2015).

Intellectual capital: Intellectual capital is information and skills that are of benefit to an organization (Hashim, Osman, & Alhabshi, 2015). Human capital is a main component of intellectual capital (Claver-Cortes, Zaragoza-Saez, & Gonzalez-Illescas, 2018).

Skills gap: Skills gap refers to individuals in the labor market who lack suitable skills, resulting in labor shortages required by manufacturers to fill vacant positions (Margoudi & Kiritsis, 2015).

Skills mismatch: Skills mismatch is defined as the supply of skills and the demand for skills are out of alignment in either direction (Cappelli, 2015). Job applicants either possess an oversupply or undersupply of skill sets required by the labor market.

Skills shortage: Skills shortage is defined as a unique type of mismatch (Cappelli, 2015).

Assumptions, Limitations, and Delimitations

In this section, I address the assumptions, limitations, and delimitations that are critical components of a study. Assumptions are components of a study accepted as true without proof. Limitations are aspects of the study that are outside the control of the researcher. However, delimitations are elements within the control of the researcher, such as population and sample. I explored the possible weaknesses and concerns that could affect the outcome of the study.

Assumptions

Assumptions are components of a study accepted as true without evidence (Yang, Liang, & Avgeriou, 2018). The following assumptions may have affected the study. First,

I assumed the interview participants had adequate knowledge of the organizations' recruiting practices, would answer the interview questions truthfully and honestly, and would provide relevant and accurate documents related to recruitment strategies. To reduce the risk of dishonesty, each participant received a consent form explaining the participant's rights to refrain from answering any question. Second, I assumed that the classification of the major manufacturing employers by the County Economic Development Commission was relevant for my case study.

Limitations

Limitations are potential weaknesses that may affect the study (Yin, 2018). One important limitation was that the findings may not be generalizable to all agencies in all locations because the case study sample may be too small to make generalizations. Another limitation included time constraints that limited access to the participants.

Delimitations

Delimitations are elements that confine the scope of a study and establish the boundaries within the control of the researcher (Nelms, 2015). Delimitations for this study included the geographic location of the study and the sector of the industry. First, I only focused on the manufacturing industry because the purpose of the study was to explore strategies that hiring managers used in recruiting skilled production workers to sustain business profitability. Second, each of the companies is in southeastern North Carolina, which is the boundary of the study because this particular area is representative of most areas throughout the United States.

Significance of the Study

The significance of this study is apparent when understanding the fundamental challenge in recruiting manufacturing employees and the degree to which organizations lose profit because business leaders lack strategies to recruit skilled workers. Human resource professionals have stated that a reduced labor supply combined with increasing demand will cause dire labor shortages over the next 3 decades, which could suppress company growth (Irshad, 2016).

Contribution to Business Practice

Business practice may be improved as strengthened workforce skillsets may enhance the quality of service provided, leading to profit generation, job security, and improved business partnerships, reputation, and reliability. Employers report thousands of unfilled manufacturing positions due to a shortage of skilled workers (Javdekar et al., 2016). By addressing the challenges in hiring skilled workers, this study may help manufacturing executives improve or develop recruiting strategies for skilled workers, resulting in increased production, profitability, and a more experienced skilled human capital pool. The findings could encourage business leaders and hiring managers to assess their organization's recruitment strategies and consider alternatives, which may improve organizational performance of manufacturing companies in southeastern North Carolina. Findings and recommendations from this study may contribute to the economic development commission experiencing increased success in attracting businesses and encouraging businesses to remain and expand operations in southeastern North Carolina.

Implications for Social Change

The implications for social change may include local economic stability through strengthened business activities, which may lead to improved local lifestyles and wellbeing for employees and their families. Social change implications may also include workforce and economic development, leading to higher incomes for businesses and workers. The application of the findings from this study may also identify key processes such as training, continuous improvement, and sustainability reporting regarding recruitment strategies with the goal that organizations learn from and quickly adopt new practices (Meza-Ruiz et al., 2017).

A Review of the Professional and Academic Literature

The purpose of this study was to explore recruitment strategies hiring managers of manufacturing companies used to recruit skilled production workers to sustain business profitability. The education and training of workers is fundamental to the growth and success of a business. In a 2013 report, 774 million adults lacked basic education and literacy skills (Kaiper, 2017). A skills gap impacts almost every industry, job, and employer. Employees' skills influence manufacturing flexibility and new product development, which positively impacts business performance (Mendes & Machado, 2015).

I began the professional and academic literature review with a search of Walden University library databases: Business Source Complete, EBSCOhost, Emerald Management Journals, ProQuest, Central, and Sage Premier. Additional searches included Science Direct, Google Scholar, and Thoreau Multi-Database Search. Key

search words included *human capital, intellectual capital, aging workforce, manufacturing jobs, labor shortage, skills gap, knowledge transfer, skills mismatch,* and *competitive advantage*. I used Boolean operators, including AND and OR to maximize the results. In this literature review, I examined peer-reviewed and seminal journal articles, books, and papers published within the last 5 years (2015 – 2019) of my expected year of CAO approval of my completed study. To meet Walden DBA requirements, of the 89 articles included in this literature review, 91% were 2015 and newer and peer-reviewed. The eight references published before 2015 are relevant as the researchers provided important background and foundational information to the study.

In this literature review, I provide the theory of human capital as the conceptual framework for this study. I discuss recruitment and selection, talent gap, shortages in the manufacturing industry and the relevance of manufacturing, and the effects of retiring baby boomers and the skills gap.

Theory of Human Capital

Countries do not sustain economic development without substantial investments in human capital. Human capital refers to experts' or employees' knowledge, skills, abilities, and experience that productively adds value to the organization (Teodoro & Switzer, 2016). In the 1950s and 1960s, human capital theorists, supported by empirical studies, presented positive correlations between education, income, and economic growth (Choo, 2018). Human capital theory was developed from the classical school of economics (Minica, 2011). Petty was the first to evaluate training and recognize labor as a critical component of wealth. Smith considered educational levels and qualifications as

a form of capital. Workers' improved skills were considered as a machine or labor tool, which generated an increase in income. Proceeding Smith, economists considered capital as the strategic growth factor and underestimated the importance of education and professional training of employees (Minica, 2011).

Marshall attracted attention to the relevance of investment in man's general education by advancing the function of education as the basis of professional mobility of the labor force (Minica, 2011). In comparison with Smith, Marshall considered education as a platform of professional adaptability and mobility of the labor force (Minica, 2011). Fisher presented a composite theory on capital in the first decade of the 20th century. Fisher stated that people's education or training, similar to capital investment, added to future revenue flows when included with the idea of capital. Businesses began investing in man after World War II, when a shortage of specialists became critical to meet the needs of society, thus enriching the human capital theory (Minica, 2011). Human capital theorists explained that education and training are vital to modern production and that a country's economic power is determined by the scientific and technical achievement of man as a contributor to the current labor force (Minica, 2011). Tenets of human capital theory include the belief that productiveness of trained persons increases with education, and differing levels of individual training and productiveness triggers corresponding differences (Minica, 2011).

Individuals strive to secure and retain jobs. Labor market participants compete to attract and retain individuals. In managing human capital, strategic human resource management theorists proposed that increased employee abilities, motivation, and

opportunities to perform resulted in higher productivity, better customer service, and improved organizational performance (Dineen & Allen, 2016). The ability-motivation-opportunity model theorists suggested that the relationships between human resource management practices and employee-level and firm-level outcomes is influenced by the effect of human resource management practices on employees' abilities, motivation, and opportunities (Delery & Roumpi, 2017).

Scholars have indicated the positive relationship between high-performance work systems, employee ability, motivation, and opportunity and human resource management systems. Based on theory and comparative results from different methodologies, Delery and Gupta (2016) discovered that ability-enhancing, motivation-enhancing, and opportunity-enhancing human resource management practices influenced the effectiveness of organizations. Researchers have indicated strong support that the ability-motivation-opportunity model helps to explain business productivity and success (Delery & Roumpi, 2017).

Researchers have applied the resource-based view to explain that businesses achieve competitive advantage through investment in the valuable and unique capabilities of human capital (Shin & Konrad, 2017). Resource-based theorists stated that when properly designed and implemented, human resource management practices generate and maintain a competitive advantage for the firm (Delery & Roumpi, 2017). Organizational competitive advantage may emerge when human resource managers develop firm-specific skills (Delery & Roumpi, 2017). Human capital is the origin of sustainable competitive advantage (Delery & Roumpi, 2017).

Competitive advantage depends upon the effectiveness of the relationship between human resource management practices and human capital resources. Extensive training, selective hiring, and other high-performance work practices impacts the ability of the workforce (Delery & Roumpi, 2017). Businesses compete through the recruitment and selection processes to select the best human capital. Delery and Roumpi (2017) suggested that scholars provide data relative to the resource-based view that will reduce the micromacro divide. Kaufman (2015) highlighted that scholars should expand the society for human resource management models by including economic theory and other approaches. McClanahan (2017) posited that human capital theory emphasized increasing the national employment and individual income and educational relationships.

Human Capital Theory

American economists Schultz, Becker, and Mincer coined the theory of human capital from 1961 to 1970 and are credited as the main authors (Choo, 2018; Minica, 2011). Schultz announced the concept of human capital theory and asserted that an individual's investment in knowledge and skills increased national output (as cited in Kaiper, 2017). Becker emphasized that education and training were the most important investments toward increasing human capital (as cited in Kaiper, 2017). The research studies of Nobel Prize laureates contribute to the importance of the human capital theory.

Sweetland (1996) expounded upon the importance of human capital theory and early economic viewpoints. Individuals and society receive economic benefits from investments in people. Since 1971, scholars have received five Nobel Peace Prizes in the field of human capital theory. Schultz and Becker were recipients of the Nobel distinction

award. Friedman and Kuznets were Nobel Prize recipients for their work in 1945, connecting medical profession incomes to investments in education. Solow was recognized in 1957 for identifying the relationship between education and aggregate production function, which addressed how real gross domestic product in an economy depends on available inputs. Skilled individuals add to aggregate output, which depends on physical capital such as machines and production facilities.

Individuals possess skills, experience, and knowledge that are of economic value to a business. Human capital is knowledge, skills, abilities, and other traits of individuals that contribute to organizational productivity (Čiutienė & Railaitė, 2015). Brymer, Molloy, and Gilbert (2014) studied the resource-based theory and prior work on alignment between strategy and human resource practices to address the lack of management theory on human capital pipelines and their implications on competitive advantages for companies. An essential feature of human capital is profitability. Academy sources for human capital include universities, companies that identify and develop highly qualified individuals (GE & McKinsey & Company), and professional associations (Brymer et al., 2014). Pipeline sources include universities, companies, and affinity groups (Brymer et al., 2014).

Human capital is essential to ensuring organizational performance. Human capital is a part of the product or service most businesses offer to the marketplace (Brymer et al., 2014) and is a blend of genetic inheritance, attitude, education, and work-life experiences (Hashim et al., 2015). Customer, structural, social, technological, and spiritual capital are

segments of intellectual capital. Compared to capitals or equipment, human capital is the most valuable asset to business and the most neglected by firms (Hashim et al., 2015).

One assumption of the human capital theory is that education helps develop skills of work or improves the ability of the worker to be productive (Benson, 1978). Education increases the productivity and earnings of individuals and, therefore, is an investment critical for individuals but also key to the economy of a country (Tan, 2014). Educators and policymakers who understand human capital theory can evaluate human capital studies from economic, sociology, psychology, political science, human development, and business perspectives by applying the principles of the importance of human capital (Sweetland, 1996). Sweetland (1996) stated that educators may address concerns based on economic trends and cycles, design educational programs to contribute to economic growth without damaging the purpose of education, and clearly examine the economic component of education. Parents expect students to receive usable diplomas and job specific skills to ensure productive participation in the economy (Sweetland, 1996). Sweetland also posited that industrialists desired an educational system to prepare graduates to produce in a competitive workforce. Education and development training are critical investments in human capital.

The primary concept of human capital theory is that a key source of competitive advantage is the skills, knowledge, and experience possessed by individuals or populations, relative to their value or cost to a firm or country (Kolomiiets & Golovkova, 2017). Coff and Raffiee (2015) stated that human capital specific to a firm is also a source of sustained competitive advantage. Scholars have compared differences between

earnings among people or families within geographic regions (Minica, 2011). The specific skills and abilities of a firm's workforce affect productivity and competition for human capital.

Competitors can replicate the skills and knowledge of human capital. However, when used to the maximum advantage, human capital is the most essential resource to generate sustainable competitive advantage. Human capital theorists have indicated that a planned approach to development of human capital has enabled organizational success (Minica, 2011). Researchers have studied the relationship between human capital and innovation. Human capital is skills, knowledge, and experience individuals bring to their workplace effectively used to increase revenues (Kolomiiets & Golovkova, 2017). Both individuals and society benefit from human capital as a key source of competitive advantage, measured by levels of education and investment in human capital. Individual capabilities and qualities contribute to emerging and developing new economies based on innovative ideas and solutions.

Human capital is a valuable asset to be developed which leads to improved organizational performance. Strategies advocated to draw, grow, position and keep staff are important to human capital. Human capital includes a combination of knowledge, skills, experience, creativity, labor, attitudes and motivations working collectively to increase revenues (Čiutienė & Railaitė, 2015). The Society for Human Resource Management focuses attention on knowledge and dynamic leadership traits as sources of competitive advantage. Human capital is a primary resource when employee skills,

knowledge, competencies, and loyalty is not easily acquired, copied or transferable to competitors.

As aging workers approach retirement, businesses face a diminishing labor pool of qualified job applicants (Sandborn & Prabhakar, 2015). Workers possess obsolete skills and require retraining and education to remain employable. Workers with outdated skills are a growing challenge for firms. Sandborn and Prabhakar (2015) affirmed that product manufacturers demand reliable, skilled applicants to operate firms successfully and to minimize disruptions. Mismatches exist between the skills possessed by workers and the skills needed by employers and are classified as: skills obsolescence, skill shortage, and critical skills loss (Sandborn & Prabhakar, 2015). Human capital or skills obsolescence is when workers lack needed skills, have obsolete skills, and require retraining. Outdated skills include the erosion of skills due to aging or illness, insufficient use, technological and organizational change, employment shifts, and displacement of company-specific skills (Sandborn & Prabhakar, 2015).

Organizations view human capital as a potential source of sustained competitive advantage in a time of global competition and technological change. Researchers assessed the influence of voluntary turnover, involuntary turnover, and new hires on the relationship between organizational human capital and labor productivity by reviewing data from 1,911 Italian manufacturing firms (Della Torre, Zatzick, Sikora, & Solari, 2018). The author's findings indicated that the integration of new hires disrupted the relationship between human capital and productivity, specifically for firms with technologically intensive operations. The human factor is critical to investments in

employee human capital, productivity, and small and medium-sized enterprises (SMEs) benefiting from internationalization (Onkelinx, Manolova, & Edelman, 2016). Investments in human capital can result in a competitive advantage necessary for success in foreign markets (Costa, Vicarelli, & Pappalardo, 2017). Simultaneous entry in multiple international markets required high levels of labor productivity and a well-educated and highly trained workforce (Onkelinx et al., 2016). The quality of employee human capital influences the productivity and economic success of a firm.

Over the last decades, human capital has contributed to the economic success of developed countries. If executives realized the importance of human capital, economic growth and development strategies could be successful for firms (Minica, 2011). Human capital reflects the physical and intellectual aptitudes and characterizing labor and creation capacity of man and expenditures for improving and acquiring viable skills sets (Minica, 2011). According to Minica, countries failed to reach sustained periods of economic development without having invested in the labor force. Investments in man has an instrumental value and allows the increase of the productiveness of trained personnel and emphasizes positive changes in economic and social activities. Firms develop as employees' individual knowledge and abilities perform the processes of organizations (Delgado-Verde, Martin-de Castro, & Amores-Salvado, 2016).

Lepak and Snell (2002) examined the attributes of human capital and human resource configurations for employees in knowledge-based and job-based employment, contract work, and alliance/partnership employment categories. Results from 148 firms revealed that the strategic value and uniqueness of human capital differed across

categories. The uniqueness of human capital referred to the degree to which an individual's skills were rare, specialized and firm-specific. Angelopoulos, Malley, and Philippopoulos (2017) studied the impact of human capital accumulation and worker transition to skilled employment. The authors indicated that human capital increased labor productivity and enabled worker transition to skilled employment. Skilled workers and the economy benefit from education reforms linked to higher capital accumulation, (Angelopoulos et al., 2017).

Organizations acquire human capital externally by paying the market wage for labor. Human capital makes a valuable contribution to a firms' competitive advantage or core competence by improving efficiency and effectiveness, exploiting opportunities, or neutralizing threats. Human capital value was highest for knowledge-based and job-based employment. Firms developed strategizes to identify and retain critical workers (Lepak & Snell, 2002). Lepak and Snell (2002) emphasized the importance of employment analysis to understand how businesses strategically managed human capital.

Human capital results from a firm's investment in hiring individuals. Snell and Dean (1992) explained the concept of human capital as individuals possessing skills, experience, and knowledge of economic value to firms and applied it to the selection of personnel. Individual's skills and knowledge enhance firm productivity and represent capital by adding value as employees perform future services for an organization. Human capital has a market price when exhibited in work performance and is valuable to other firms. Human capital is not transferable, and firms do not own human capital. Selective staffing has an important effect on integrated manufacturing. Snell and Dean (1992)

investigated 512 manufacturing metal-working firms, examining relationships between integrated manufacturing and human resource management practices. The researcher's work supported previous arguments that integrated manufacturing would be more successful when accompanied by improvements in employee skills. The trend across firms indicated that integrated manufacturing presented opportunities for increased employee contribution supported by investments in human capital.

Human capital resources enable organizations to compete strategically through attracting, retaining, and developing talent (Nyberg, Reilly, Essman, & Rodrigues, 2018). Powerful businesses such as AT&T, IBM, and GE use advanced analytics in selection, training, performance management, and retention processes (Schiemann, Seibert, & Blankenship, 2018). Globalization has increased competition and worker STEM skills and workforce competencies are in short supply while manufacturers watch the shrinking pool of qualified workers available to fill positions. With the U.S. unemployment rates near 5%, manufacturers experience major challenges in attracting, developing, and retaining key talent (Schiemann et al., 2018). Human capital and information creates competitive advantages for the industry. Using data of firms operating in Spain, researchers indicated that human capital was essential to manufacturing competitiveness and product innovation, and that research and development human capital led to excellent innovation performance (Zouaghi, Sanchez, & Martinez, 2018). Human capital information is an essential competitive advantage to those who can harness powerful data and convert it into knowledge to drive their businesses. Even with substantial investments in human capital, organizations experience turnover in human capital.

Context-Emergent Turnover Theory: A Theory of Collective Turnover

The collective loss of human capital significantly impacts business performance and competitive advantage. Nyberg and Ployhart (2013) defined collective turnover as the depletion of employee knowledge, skills, abilities, and other characteristics (KSAOs). The theory of collective turnover is based within the framework of human capital resources and resource-based theory. The authors used the context-emergent turnover (CET) theory to explain climate and environmental complexity influences on collective turnover and its consequences and to examine the relationships between collective turnover and human capital resources and the effects on firm performance. Nyberg and Ployhart (2013) based collective turnover theory within the resource-based view and proposed that collective employee turnover was the depletion of human capital resources. Context-emergent turnover theory altered the focus of collective turnover from primary focus on individual job leavers to an expanded focus on exhaustion of human capital resources.

Human capital is considered the most significant element of intellectual capital, since individuals are primarily responsible for accomplishing work, especially efforts leading to innovative ideas. In a sample of employees from a well-known U.S. retail chain, researchers revealed how turnover rates and replacement hires influenced unit performance (Call, Nyberg, Ployhart, & Weekley, 2015). A one standard deviation increase of 18.10% in the employee turnover rate correlated to an additional 9% profit loss (Call et al., 2015). Nyberg and Ployhart (2013) discussed the relevance of knowledge-based recruitment and selection and confirmed the role of human capital as a

forerunner to structural and relational capital, its influence on innovation through the intellectual capital components, and the relevance of knowledge-based recruitment and selection.

Intellectual Capital

Human capital is a main component of intellectual capital (IC) and an asset to a business. Knowledge that is valuable to an organization is defined as intellectual capital (Hashim et al., 2015). Human, structural, customer, social, technological, and spiritual capital comprise the elements of intellectual capital (Hashim et al., 2015). Hashim et al. (2015) distributed a structured questionnaire to higher-level managers working in various organizations in Malaysia. The researcher's sample size included 187 respondents based on a random selection and data was analyzed using the multiple regression analysis model. The author's findings revealed that intellectual capital significantly influenced the organizational performance in Malaysia. Researchers have conducted extensive studies which have proven that intellectual capital positively influenced firm performance (Hashim et al., 2015) and generated organizational value through innovations (Bacila & Titu, 2017). Mehralian, Nazari, and Ghasemzadeh (2018) analyzed 470 questionnaires received from pharmaceutical companies in Iran and discovered that knowledge creation activities influenced organizational intellectual capital and that intellectual capital positively impacted the balanced score card.

Intellectual capital impacts firm performance and adds value creation to the organization (Barkat & Loo-See, 2018). Organizational managers in Ecuador identified a positive correlation between intellectual capital management and innovation in the

production and export activities of 39 companies (Claver-Cortes, Zaragoza-Saez, & Gonzalez-Illescas, 2018). Zhang, Qi, and Guo (2017) collected data from 645 manufacturing plants in 10 countries to provide insights into how intellectual capital and knowledge improved process innovation and mass customization capability development. Kianto, Saenz, and Aramburu (2017) surveyed 180 Spanish companies using structural equation modelling based on partial least squares to examine the relationships between knowledge-based human resource management practices, intellectual capital and innovation. The researchers' findings indicated that human capital was a key enabler in firm innovation. Sardo and Serrasqueiro (2017) analyzed a large sample of non-financial firms from 14 countries in Western Europe and revealed IC and human capital as critical to the wealth and competitive advantage of a business.

Investments in intellectual capital have been growing and competing with physical and financial capital investments. Irshad (2016) emphasized organizations attracting human capital instead of financial capital. In the United States, the Apple company had a share market value of above USD600 billion that directly resulted from investment in intellectual capital and revenue from apps and its network (Jafaridehkordi & Rahim, 2015). Google and Microsoft were among the companies investing low in fixed assets, but significantly in intellectual capital. Microsoft's tangible assets accounted for 7% of share market, while the remaining 93% was derived from intangible assets (Jafaridehkordi & Rahim, 2015). Companies which balance the intellectual components of a robust infrastructure with an educated and skilled workforce strengthen efforts to establish and maintain competitive advantage. Human capital is not the property of the

organization (Ganco, Ziedonis, & Agarwal, 2015). Employees leave organizations, taking with them valuable knowledge and skills. In a global economy, manufacturers experience a shortage of qualified job applicants to fill vacant positions.

Shortages in Manufacturing

Individuals function in a global economy where they make, buy and consume products. Emerging technologies will influence manufacturing in future years. A reality for manufacturing hiring managers is a significant portion of job applicants lack the skills required by employers. Cappelli (2015) stated that Deloitte and the Manufacturing Institute reported a shortage of qualified candidates. Retirements of workers born between 1946 and 1964 and economic expansion contributes to the shortage of skilled workers. By 2025, manufacturers predicted 2 million job vacancies, while the American Welding Society stated a shortfall of 300,000 welders and welding instructors by 2020 (Guth, 2018).

Additional factors include loss of knowledge due to the mobility of experienced workers, a negative image of the manufacturing industry among younger workers, lack of STEM (science, technology, engineering and mathematics) skills among workers, and a decline of technical education programs in public high schools. McKinsey Global Institute predicted a shortage of tens of millions of educated workers across the developed economies in the future (Cappelli, 2015). Chief Executive Officers of Pricewaterhouse Coopers believed that labor shortages would impact their companies' future success (Cappelli, 2015). Manufacturing businesses face a growing talent gap between the skills workers possess and skills required by employers.

Talent Gap

One challenge for organizations is hiring the right people with the right skills into the right positions. Manpower Group explored the degree to which leading employers encountered difficulty filling talent; what jobs were most difficult to fill and why; concerns over the impact on stakeholders; and what strategies employers implemented to overcome the talent shortage (Irshad, 2016). Irshad (2016) asserted that the shortage between the demand and supply of talent will likely continue to increase for highly-skilled workers. Talent professionals emphasize workplace productivity through improved recruitment and employee development designed to meet business needs. The interests included recognizing untapped talent pools, such as increasing the number of women in engineering. According to a 2015 study, women comprised only 27% of the manufacturing workforce (Guth, 2018).

National leaders desire strong manufacturing sectors. Manufacturing backshoring gained the interest of governments, practitioners and researchers (Stentoft, Olhager, Heikkila, & Thoms, 2016). Stentoft et al. analyzed 20 peer-reviewed international scientific journal articles published from 2009 to early 2016. The authors identified access to skills and knowledge as a relevant factor in decisions to relocate some manufacturing back to companies' home countries. Specific concerns regarding skills and knowledge were nearness to research and development resources, skilled labor availability, and use of new technologies and automation. The threat of losing know-how and intellectual property was also a concern. As labor cost differences diminished

between geographic market regions, access to skills and knowledge would perhaps gain importance.

Organizations incur substantial risk with the loss of key human capital delaying or preventing completion of production objectives and schedules (Israelsen & Yonker, 2017). Human capital is an important aspect of most firms. Pharmaceutical products and the computer segment of business industry accounted for approximately 20% of U.S. firms exposed to key human capital risk, and firms with key human capital are more innovative (Israelsen & Yonker, 2017). Israelsen and Yonker (2017) included pharmaceutical products (30%), business services (27.7%), petroleum and natural gas (25.3%), measuring and control equipment (24.4%), and computers (23.3%) in the top 10 industries by percentage of firms with key human capital. Innovative organizations apply human capital analytics to effectively manage talent resources and achieve competitive advantage through people (Schiemann et al., 2018).

Henry Ford understood that if workers ran the assembly lines, the company yielded revenue and profitability. AT&T, IBM, GE, and other major conglomerates applied analytics to the selection, training, performance management, and retention of personnel (Schiemann et al., 2018). Manufacturing managers should watch skilled employees by studying the loss of innovation, which increases employment and job creation (Zouaghi, Sanchez, & Martinez, 2018). Human capital, education and skills and training policy enables individuals to support innovations to ensure businesses survive intense competition (Zouaghi, Sanchez, & Martinez, 2018).

Skills Gap

The skills gap in manufacturing industry is the struggle to recruit skilled employees, and the industry identifies this challenge as a critical barrier to production success (Margoudi & Kiritsis, 2015). Education, jobs, skills and training programs play a critical role in transforming communities. Manufacturers require basic STEM (Science, Technology, Engineering and Math) skills of employees. Applicants lack basic technical and industry-employability skills. Survey respondents reported that more than half of possible candidates exhibited weak creativity, adaptability, and interpersonal communication skills (Margoudi & Kiritsis, 2015). Margoudi and Kiritsis (2015) presented two innovative projects to address the European and global manufacturing skills gap phenomenon. The ActionPlanT approach for industrial learning and the Manuskills approach for manufacturing learning focused on current manufacturing skills and methods to attract and train young individuals interested in manufacturing jobs. The main goal of ActionPlanT is developing worker competence. Awareness is the primary learning objective and central theme in the Manuskills approach.

Enormous changes have occurred in labor markets. The skills required by employers for high-paying positions have increased considerably and often change (Holzer, 2017). Labor markets remain tight locally and throughout the country. Jobs in advanced manufacturing, health care, hospitality, information technology, retail and other fields requiring more skill are growing commented Holzer. The unemployment rate for the second quarter of 2018 is down below 4%. As baby boomers retire and the labor market becomes tighter, employers may consider job applicants overlooked in the past.

Strong manufacturing operations are foundational to the economic prosperity of nations. The skills gap creates a threat to communities and economic stability and progress. Older workers in the United States energy industry are expected to grow by more than 25% by 2020, and more than a third of the workforce is over 50 years old (Irshad, 2016). Manufacturing hiring managers may experience difficulty in recruiting qualified workers. Scholars have documented Toyota Motor Corporation, United Parcel Service, Inc., Costco Wholesale Corporation, Four Seasons Hotels and other well-known American companies which have invested in updating the skills of workers through significant on-the-job training (Holzer, 2017).

The United States workforce faces a difficult situation that exists between unemployed workers unable to find jobs and employers unable to find workers with the qualifications to fill vacancies. Indiana and other Midwestern states left jobs unfilled due to a lack of applicants with the required qualifications (Christo-Baker, Sindone, & Roper, 2017). The middle skills gap refers to specialized mechanical, technical, and production positions that require certifications but not a four-year college degree. Manufacturing, construction, and healthcare incur the most significant skills shortages (Christo-Baker et al., 2017). Researchers projected that in Indiana the shortage will remain close to the 55% level, as it was in 2009 (Christo-Baker et al., 2017).

Boeing Aircraft Company established agreements with 29 high schools and 24 community and technical colleges in the state of Washington to align training programs with job openings in efforts to ensure the future of manufacturing (Rosendin & Gielczyk, 2018). Behie and Henwood (2018) predicted very high skills gaps in many critical fields

between 2020 and 2030 in Canada and the United States, potentially reducing economic growth worldwide. The labor shortage will involve 80% skills of workers, not number of available workers (Behie & Henwood, 2018). In the oil and gas industry, a young technician requires 8-9 years of experience before making technical decisions without the probability of costly mistakes (Behie & Henwood, 2018).

Recruitment Challenges

Few job applicants are attracted to the manufacturing industry. Holzer (2017) referred to labor demand as the quantity and quality of jobs created, in addition to the recruitment, hiring, and training decisions by employers to fill vacancies. Recruitment refers to methods by which a company advertises positions, occupations, or organizational information to applicants (Campion, Ployhart, & Campion, 2017). Both employers and candidates encounter barriers when even entry level jobs require occupation-specific human capital (OSHC) (Campion et al., 2017). Employers lack access to important information regarding potential employee production capabilities to make effective hiring and placement decisions (Cooper & Davis, 2017).

Organizations must employ human capital management expertise to develop and manage appropriate recruitment strategies and human resources (Delery & Roumpi, 2017). Organizations could achieve a sustainable competitive advantage with noticeable impact on the bottom-line by being more innovative in sourcing and recruiting (Sahay, 2015). Sahay (2015) examined how lean principles from manufacturing were adaptable to recruiting and demonstrated a connection between recruitment and positive business

results. Sahay based the design methodology approach on practitioner experience of leveraging the Lean Six Sigma tools to improve the acquisition of talent in organizations. After analyzing 78,157 job applicants, Campion et al. (2017) concluded that applicants with prior knowledge of the occupation achieved higher degrees of occupation-specific human capital, were higher quality candidates, and improved employability (Campion et al., 2017). An organization's recruitment strategies may affect applicants' occupation-specific human capital investment decisions. Talent acquisition impacts an organization's bottom line, and firms need the right talent for business success.

The greatest risks in talent management are the costs of mismatch in employees and skills and losing talent development investments through failure to retain experienced employees (Sahay, 2015). Managers must remove actions that lack customer value in manufacturing processes. Competent talent is critical to creating new products and services and innovative ways to improve business operations (Sahay, 2015). Executives apply Just-in-Time recruiting to provide hiring clients with the best candidates with the right skills at the right place. The goal of talent management is to ensure companies are competitive and profitable. The cost of mismatch in employees and skills and of losing talent development investments through failure to retain employees are two risks of talent management (Sahay, 2015).

Dineen and Allen (2016) used archival and survey data from 624 best places to work (BPTW) participants across a three-year period to develop and test hypotheses linking BPTW certifications to collective turnover rates and key informant perceptions of applicant pool quality. Researchers reviewed the size of companies and industry job

opening mediators. Findings revealed that increased certifications resulted in an applicant pool quality that was higher in smaller companies and higher when job openings were scarcer. Dineen and Allen analyzed advanced theory's relevance to company decisions regarding seeking or re-seeking third party certifications. When leaders understand the effects of skills gaps on companies and industry trends, organizations can develop effective recruitment and employee development strategies to address the talent gap and recruitment challenges.

Human resource managers experience key challenges and trends in recruiting skilled workers in manufacturing. Hiring managers rely on online resources as a primary recruitment venue for human capital. Anderson (2017) proposed a human capital network to measure applicant skills as online marketplaces increase in significance in matching workers to employers. Workers recognize compatible skill sets, new skills sets in demand, and guidance on potential employers. Companies must recruit qualified human capital to provide products and services that create superior value for customers and build a competitive advantage (Greer, Lusch, & Hitt, 2017). In a subsidiary of Kroger, implementation of a supply chain strategy was finally successful after the solution was submitted from lower-level workers (Greer et al., 2017). Organizations experience difficulty retaining qualified employees in a critical manufacturing industry.

Relevance of Manufacturing

American economic prosperity is dependent upon a strong manufacturing industry. Annually, manufacturing contributes almost $2.2 trillion to the United States' gross domestic product (Anid, 2018). Manufacturing companies create additional jobs in

other sectors of the economy. For each dollar spent, $1.81 is added to the United States' economy (Anid, 2018). In Massachusetts, the manufacturing industry was the fifth largest employer, according to a Jobs for the Future report (Javdekar et al., 2016). Kim and Park (2018) stated a direct correlation between total factor productivity growth and a country's upward transition from middle-income to high-income country group. Labor quality improved with increases in human capital (Kim & Park, 2018). The authors argued that formal education was a major means of improving human capital, and that human capital were important sources of total factor productivity. Businesses practice corporate social responsibility by ensuring the sustainable use of precious and limited energy resources. Scharf et al. (2018) conducted a study focused on innovative plant technology for a sustainable heat treatment of aluminum components. The author's results indicated CO2 emissions were reduced 60%, while reducing operating costs more than 75% and maintaining component quality.

Business operational capabilities depend upon product quality, dependability, costs, and flexibility. Manufacturing companies experience increased global competition on production costs, product quality, and innovation (Brettel, Klein, & Friederichsen, 2016). Companies are challenged to sustain competitive advantage and provide quality products at an affordable cost (Brettel et al., 2016). Manufacturing flexibility allows smaller companies to attain greater performance gains than large corporations, and large corporations benefit by absorbing certain processes from smaller companies (Brettel et al., 2016). Upton posited that an important connection exists between the age of technology, worker experience and manufacturing flexibility, suggesting that production

flexibility correlates with technology improvements and qualified employees (Brettel et al., 2016). In an economic review of flexible manufacturing systems, Kuzgunkaya and ElMaraghy reported a positive relationship between production and supply chain flexibility, operational and firm performance (Brettel et al., 2016). Manufacturers and market systems benefit significantly from flexible manufacturing systems.

Flexible manufacturing systems provide different end products using similar manufacturing resources. Researchers emphasized that additive manufacturing technology was the start of a new industrial revolution by expanding upon the attributes of traditional flexible manufacturing systems technology (Weller, Kleer, & Piller, 2015). Attaran (2017) defined additive manufacturing as technologies including 3-D printing, rapid prototyping, direct digital manufacturing, layered manufacturing, and additive fabrication. Businesses using flexible manufacturing technology may attain a competitive advantage in a marketplace of unpredictability, product variation, or changing customer purchasing habits. Revenues from the additive manufacturing industry are expected to increase to $12.08 billion by 2018 and exceed $21 billion by 2020 (Attaran, 2017). Companies seeking to improve manufacturing efficiency have access to new opportunities through additive manufacturing innovative technologies. Attaran (2017) explained that cost, speed, quality, innovation/transformation, and impact are five key benefits additive manufacturing has over traditional manufacturing.

Additive manufacturing technology is altering the consumer experience, the production and dispersal of products, and industry operations. The use of additive manufacturing in the automobile and aerospace industries is expected to increase to $1.1

billion in 2025 and $1.9 billion is the expected increase in medical and healthcare (Attaran, 2017). Industries which continue to benefit from manufacturing include aerospace, automotive, biotechnology, food, healthcare and medical, dentistry, architectural and construction, and retail. Researchers suggest that additive technologies have the potential to transform aspects of daily life.

Soshkin (2016) asserted that the United States held a significant competitive advantage in aerospace manufacturing over other nations. In 2015, the aerospace industry generated $47.5 billion in wages, equating to 8.7% of wages in the United States' manufacturing sector (Soshkin, 2016). Aerospace manufacturing is important to global transportation. In the future, the industry may encounter growing international and technological competition, a global economic slowdown, and budget limitations (Soshkin, 2016). The textile and apparel plants have exceeded the growth of all US manufacturing since 2012 (Moore, Rothenberg, & Moser, 2018). Customers desire textile and apparel products made in the USA and companies desire reshoring American manufacturing (Moore et al., 2018). The need for a skilled workforce creates intense competition for manufacturing workers. Sustainability is also an important motivator for companies to reshore.

Citing the footwear industry as an example, Weller et al. (2015) explained how a business applying additive manufacturing technology exhibited the potential to disrupt mature markets. Additive manufacturing key principles of (a) versatile manufacturing machine, (b) customization and flexibility for free, (c) complexity for free, and (d) reduction of assembly work affects a manufacturing firm's payoff processes and market

structure models (Weller et al., 2015). Manufacturing is impacted at both the firm and industry levels. A firms' dominance of additive manufacturing technology allows for control of the market and substantial increased profit margins. However, in open markets competition exists as additive manufacturing lowers obstacles to entrance into the market. Businesses serve multiple markets simultaneously, resulting in lower consumer prices.

Jiang, Kleer, and Piller (2017) conducted a Delphi survey on the future of additive manufacturing focusing on economic and societal implications in 2030. The authors completed qualitative interviews, a Delphi-based analysis of 3510 quantitative estimations and 1172 qualitative comments from 65 experts. Some researchers consider additive manufacturing a disruptive technology. Jiang et al. (2017) recommended that scholars and managers continue to monitor the forecasts for additive manufacturing.

Gandhi, Sachdeva and Gupta (2018) analyzed the relevance of service quality models to supply chains of small-medium-sized manufacturing units. The researchers reviewed 28 service quality models from 1984 to 2017 and included focus group discussion with academicians, industry professionals and small-medium-sized consultants. Organizations invest economically in-service quality to improve revenues and profits (Gandhi et al., 2018). Manufacturers focus on service processes and quality to ensure success in an extremely competitive, everchanging global marketplace.

Firms engage in green manufacturing to promote efficiency and protect the environment. Malaysia, a country located in Southeast Asia, is a top manufacturer in producing Energy Efficient Vehicles (Chian, Aziati, & Yusof, 2017). Automobile conglomerates Toyota, Honda, and BMW and international manufacturers Delphi, Bosch,

and Continental established business operations in Malaysia to support emerging markets (Chian et al., 2017). Researchers identified recruiting, selection, and training as critical factors in green manufacturing performance. The Malaysian Ministry of Education provided training in electric and hybrid vehicles. The manufacturing industry accounts for 30% of energy use and 75% of all patents in the United States, and the White House's Office of Science and Technology Policy identified advanced manufacturing as a key technology area (Anid, 2018).

Sufficient workers trained in the science, technology, engineering and mathematics fields are critical to ensure the survival and prosperity of the factories of the future (FoF) and a firm's competitive advantage. A central aim of factory of the future is to accelerate processes, improve accuracy, use supplier and service interaction intelligence and knowledge to increase competitiveness with the use of cloud services (Nodehi, Jardim-Goncalves, Zutshi, & Grilo, 2017). The concept of Industry 4.0 (Europe) and smart manufacturing in the USA encompasses the fourth industrial revolution which advances computerization, cloud computing, Internet of Things (IoT) and cyber-physical systems in manufacturing (Brad, S., Murar, M., & Brad, E., 2018). Brad et al. (2018) conducted a case study of a quick reconfigurable robotic manufacturing cell and demonstrated the feasibility to rapid design smart connected manufacturing resources and integrate them into factory of the future designs that support convertibility, integrability, modifiability, adaptability, serviceability, scalability, integration of product resources, service clustering and cloud-based services.

A primary theory of the worldwide factory of the future movement is that information systems are interconnected to the degree of self-organization and autonomy (Bildstein, Feng, & Bauernhans, 2018). Production planners and workers are released from routine daily tasks while machines and information systems support crucial decisions. Nodehi et al. (2017) posited that employing cloud services enabled factories of the future to improve product quality and develop new technologies in manufacturing enterprises. Workers are significantly impacted by technological changes occurring within the manufacturing industry.

Technological Changes

New technologies have changed the nature of work and are disruptive to manufacturing. Berger and Frey (2017) studied new industries which primarily emerged in new locations that specialized in human capital with the skill sets to perform the jobs. The researchers used the US Census Bureau's *Alphabetical Index of Industries* to document the creation of new industries in the US economy stemming directly from technological advances. An instrumental variables strategy was employed as a tool to identify contemporary differences in human capital. Berger and Frey (2017) suggested that researchers conduct additional studies on how firms and individuals respond to digital technologies and employment opportunities created by technological changes.

Kim and Park (2018) stated that establishing a quality educational system to increase human capital was vitally important in improving productivity growth. Sustained and adequate educational investments are essential to support quality improvements in education and skill development. The authors presented a strong relationship between

human capital accumulation and innovations. In examining the changing workforce, retiring workers have a significant impact on the skills gap phenomena. Manufacturing operations benefit from limited industrial robotic applications. Robotic handling operations accounts for only 38% of manufacturing operations, whereas robotic welding, robotic assembly, robotic dispensing, and robotic processing accounts for 29%, 10%, 4%, and 2% respectively (Ogbemhe, Mpofu, & Tlale, 2017). Robots are easily adaptable to completion of varied tasks unlike obsolete forms of automation. Robotic efficiencies contribute toward sustainability in manufacturing. Ogbemhe et al.'s (2017) findings confirmed that robotics created employment instead of reducing jobs, with 1.9-3.5 million new jobs projected in the next 8 years. Community jobs are sustained with the preservation of manufacturing jobs. Countries that have embraced robotics to achieve sustainability in manufacturing have increased output.

Employers, job seekers, current workers, robot manufacturers and educators are affected by robotic skills shortages. Stakeholder's ensure a comprehensive training framework adequately imparts knowledge and awareness in robotics through certifications and stackable credentials (Ogbemhe et al., 2017). Job seekers and current workers must embrace life-long learning to remain competent on changing technologies. In his paper, Kusiak (2018) highlighted smart manufacturing as an emerging production process integrating manufacturing with sensors, computing platforms, communication technology, control, simulation, data modelling, and predictive engineering. Smart manufacturing includes cyber-physical systems connected by the internet of things, cloud and service-oriented computing, artificial intelligence, and data science technology

leading the next industrial revolution (Kusiak, 2018). Numerous researchers have focused attention on smart manufacturers. Thoben, Wiesner, and Wuest (2017) examined cyber-physical systems, Germany's Industry 4.0 initiative, and manufacturing endeavors in other countries. Manufacturers must embrace computer automation and complexities in order to have a competitive advantage, grow and survive in the global economy.

Human capital possesses limitless potential. Phenomenal advances in science, technology, and innovation significantly influences the future of globalization. By 2050, the World's population will exceed nine billion people and raise considerable concerns about global food and health access (Nagan & Manausa, 2018). Skilled workers are critical to manufacturing efforts to address ecological and global war systems. China's Gross Domestic Product will be 80% more than the United States' by 2050, and other G7 members will be surpassed by India, Brazil, Indonesia, and Mexico (Nagan & Manausa, 2018). Businesses exist to satisfy human needs by providing products and services. Employee deficient skills impact business operations.

The Business Impact

Manufacturing companies have encountered different operating environments over the past decades. Reasons include shorter product and market life cycles, smaller batch sizes, and higher technological requirements (Dombrowski, Intra, Zahn, & Krenkel, 2016). Dombrowski et al. (2016) asserted that companies' lack of manufacturing strategy was a neglected success factor for improving competitiveness. In manufacturing, resources and capabilities are physical, intangible assets, and core competencies and organizational processes. Resources and capabilities consider the coordination and

organization of employees and knowledge application and competencies on competitive advantages of the organization.

The manufacturing industry significantly impacts other businesses. Employers face significant challenges with the uncertainty of talent shortages in organizations and a talent gap between the skills possessed by applicants and the skills needed in organizations (Makarius & Srinivasan, 2017). Human capital influences economic growth, firm performance and strengthens the position of a country or company (Kolomiiets & Golovkova, 2017). Uhrin, Bruque-Camara and Moyano-Fuentes (2017) examined the role of human resources in a lean environment and its impact on operational performance. The industrial sector has experienced intense challenges due to increased global competition and radical technological and workforce changes. Developed employees are essential in the implementation phase of lean production, which minimizes variances in internal and external systems to the lowest possibility while at the same time creating value. Advancements in implementation of lean production corresponded to an increase in knowledgeable employees, which in turn facilitated the attainment of improved operational performance outcomes (Uhrin et al., 2017). Trained workers contribute to labor productivity, which impacts company operational performance while maintaining competitive advantage.

The skills employees currently possess, and the skills employers need are a mismatch, and the gap threatens corporate growth and global, long-term competitiveness (McDonough, 2017). Unfilled jobs cost US businesses $160 billion annually, according to a study by the Centre for Economics and Business Research (McDonough, 2017). A

U.S. talent shortage survey conducted in 2015 reported that 32% of employers had trouble filling vacancies due to a lack of qualified workers (McDonough, 2017). Shortages were reported in large industries such as health care, information technology, manufacturing, and retail. Skill shortages were not only industry specific, but company and job function specific. Once employers understand how the skills gaps affect their companies and compares those gaps with industry trends, executives can focus recruiting and employee development strategies to address challenges (McDonough, 2017).

Skilled labor was one group of occupations with a high risk of shortages because of retirements and few new job entrants. Firms fiercely compete for human capital. Organizations suffer losses when business rivals recruit valuable human capital. In assessing the business impact of manufacturing, organizations must align industry needs with the interests and abilities of potential job applicants. Macro-economist's new growth theories focus on the role of human capital on economic growth and on skills as indicators of economic performance. Technology impacts employment and skills, and the examination of the effect of technological change on employment has been a central part of economic theory since the nineteenth century (Cirillo, 2017).

Manufacturing provides (a) jobs, including creation of supporting jobs in the economy; (b) higher wages than service sector work; (c) research and development investments; and (d) increased exports and reduced imports (Stentoft et al., 2016). Germany introduced the Industrie 4.0 program considering technological, industrial, and social viewpoints (Stentoft et al., 2016). German companies expand operations in states like North Carolina, Tennessee and other regions which provide a sufficiently skilled

population (Holzer, 2017). Siemens built a gas turbine engine manufacturing plant in North Carolina after collaborating with local community colleges and universities to train technicians and engineers. International companies view the United States as a positive business environment due to low operating costs and closeness to great consumer markets.

In a study of 245 high-tech firms, researchers found that specific workforce human capital skills were critical to long-term firm success and that employer difficulty in accessing skills may be a significant barrier to business growth and survival (Siepel, Cowling, & Coad, 2017). Manufacturing employees must prepare for significant changes with the implementation of Industry 4.0. Müller, Kiel, and Voigt (2018) emphasized the importance of employee qualifications and acceptance of Industry 4.0 technology. Manufacturers may encounter major challenges and obstacles due to a shortage of qualified workers, which may lead to reduced revenues and competitiveness. Manufacturers attempting to improve performance should consider human capital development options through collaboration and partnerships (Teodoro & Switzer, 2016).

Aligning With Industry and Employer Need

Job applicant interests are aligned with the needs of industry through apprenticeships and job training skill acquisition support programs. Apprenticeship programs support training in secondary schools and higher education institutions. Workforce investment boards collaborate and partner with industries on recruitment and training needs to support local businesses. Revolutionary innovations are evident in the satellite industry. According to Ensley (2017), early in the growth of the satellite

industry, military veterans provided the workforce. In an increasingly weak supply of qualified applicants, hiring managers encounter difficulty seeking, attracting, and retaining workers (Ensley, 2017). The United States' Military Academies and Stanford, MIT, California and Georgia Institutes' of Technology, Embry Riddle, Webster University and DeVry Universities provided knowledge, skills, and certifications for employment in the satellite industry (Ensley, 2017).

America must reverse the deterioration in US workforce skills. The future of manufacturing will depend upon the quality of the work force. Businesses develop partnerships with industry representatives, community colleges, local public schools and other stakeholders to solve the skills gap. Employers receive students ready to work and relationships of trust are built between stakeholders, reassuring employers that they are able to hire qualified human capital. High school students enroll in career and technical programs to create pathways into community colleges and job markets. A related approach is for students to follow career pathways through a sequence of progressions that include achieving stackable credentials and work experience (Holzer, 2017). For example, a student may become a certified nursing assistant at first, followed by licensed practical or registered nurse degrees. Specific employer skill requirements are met through these sector-based programs. Holzer (2017) posited that the most important training will occur in career and technical education programs in the high schools and community colleges.

Students receive work-based learning opportunities through apprenticeship programs. Collaborations are key to generate employer confidence in the quality of

students referred for work-based learning opportunities and over time in the workers' developing skills and in overcoming workers' lack of documented work experience (Holzer, 2017). The National Fund for Workforce Solutions has successfully built over 30 partnerships between employers, community colleges and intermediaries locally, regionally, and throughout the world (Holzer, 2017). Community colleges are accountable for producing work-ready graduates and stackable credentials for jobs in high demand. The Workforce Innovation and Opportunity Act (WIOA) is intended to help job seekers gain the work, education, training and support services critical to success in the labor market and to match employers with the skilled workers they need to compete in the global economy.

Hiring managers must expand beyond traditional hiring practices and align with industry and employer needs by developing partnerships with agencies which develop and provide a temporary workforce. Chou, Yen, and Yu (2018) investigated a large Taiwanese global supplier of semiconductor manufacturing equipment and services. The temporary work agency reduced the firms' labor shortages and profits increased for both firms. At the Frontiers in Education Conference, Zeid et al. (2016) stated that Massachusetts and other states in the US reported a shortage of skilled workers to fill advanced manufacturing positions. The researchers presented a plan to train liberal arts graduates, who were either unemployed or underemployed to fill vacant positions in advanced manufacturing to the benefit of both segments.

To address U.S. labor shortages, organizations may employ older experienced workers to contribute to the firm's competitive advantage by mentoring workers, sharing

knowledge and sustaining higher productivity levels (Heisler & Bandow, 2018). The recruitment, search and selection processes have remained primarily unchanged over the years. Hamilton and Davison (2018) recommended that managers focus more on the future skills and knowledge of applicants over current identifiable knowledge, skills, and abilities. In ten years, robotics, artificial intelligence, drones, self-driving cars and globalization will exhibit substantial changes on the world. Design Factory at Aalto University afforded students and future workers the opportunity to envision future innovative experimental ecosystems (Munigala, Oinonen, & Ekman, 2018). Executives must prepare for nanotechnology, artificial intelligence, and biotechnology as continued important emerging disciplines, virtual and brain-to-computer communications and interactions, a design-based approach to problem-solving, and a flexible degree structure supportive of broad skillsets (Munigala et al., 2018). The specific business problem was that hiring managers of manufacturing companies lacked strategies to recruit skilled production workers to sustain business profitability.

Transition

In section 1, I introduced the general business problem, a decline in qualified workers to fill vacant positions within the manufacturing industry. Section 1 also includes the background, purpose, the nature of the study, significance, the research question, and the interview questions. I continued with a discussion on the limitations, assumptions, and delimitations of the study. The review of literature supported the conceptual framework of the human capital theory, which contributes to increased productivity,

profitability, and a competitive advantage. The purpose of the study was to explore strategies for hiring managers to recruit skilled workers.

In section 2, I discuss the role of the researcher, the research methodology, research design, the participants, and ethical research practices. In section 3, I present the findings from the research, application to professional practice, implications for social change, recommendations action, and recommendations for future studies. Section 3 also includes a summary and conclusion.

Section 2: The Project

In section 2, I explore the strategies that hiring managers of manufacturing companies used to recruit skilled production workers to sustain business profitability. In efforts to sustain economic competitiveness, businesses must modify the configuration of their workforce and manage an effective workforce through recruitment strategies (Zhou, Tang, & Zhao, 2017). Global businesses have trouble hiring and retaining sufficient workers to support growth, and industry experts expect the trend to increase over the next 20 years (Pradeep, 2017). The major topics I discussed in Section 2 include the role of the researcher, the research method, research design, the participants, and ethical research practices.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies that hiring managers of manufacturing companies used to recruit skilled production workers to sustain business profitability. The population for this study included hiring managers from three manufacturing companies located in southeastern North Carolina who successfully recruited production workers with the skills necessary to sustain business profitability. The implications for positive social change include the potential to provide business leaders with successful strategies to acquire skilled laborers to ensure the viability of community businesses. The contribution to social change is to help hiring managers understand how to design and implement systematic approaches to recruiting skilled workers, which might help to ensure appropriate job opportunities in

manufacturing for skilled workers, increased business productivity and profitability, and support of economic development and prosperity in southeastern North Carolina.

Role of the Researcher

The role of the researcher is critical in a qualitative study (Fusch & Ness, 2015). The researcher is the data collection instrument and thus is a part of the research (Rutberg & Bouikidis, 2018). I served as the primary instrument for data collection. My role was to ensure participants understood the purpose of the study, the interview questions, data collection through face-to-face interviews, and the data analysis process. I had no direct relationship with the manufacturing industry or the study participants. The presence of manufacturing in the communities in which I live and my work experience are what interested me in the industry changes and challenges with the skills shortage and recruitment strategies to meet the needs of industry. As a human resources professional for over a decade, I have had the opportunity to listen to the challenges my colleagues face regarding hiring qualified applicants.

Maintaining high ethical standards are essential in research. The *Belmont Report* (1979) protocol provided key principles of human research ethics and the application to research studies. The recommendations include (a) respect for person, (b) beneficence, and (c) no expectation of harm or injustice to an individual (Kowalski, Hutchinson, & Mrdjenovich, 2017). In this study, I adhered to the protocols outlined in the *Belmont Report* by carefully choosing participants to omit vulnerable persons and preserve ethical standards. Bias damages the validity and reliability of a study. I mitigated bias and avoided viewing data through a personal lens or perspective by ensuring that the

interpretation of the phenomena under study represented the opinion of the participants and not the opinion of the researcher. An interview protocol was a plan of my interview, listing key study points, questions, and planned inquiries and transitions (see Arsel, 2017). Researchers benefit from advance preparation. An interview protocol (a) keeps the researcher focused and helps address identified relevant concepts, (b) empowers the researcher with a sense of control, (c) helps to connect analytically by translating research questions into conversations, and (d) allows the researcher to continue conversations during awkward and difficult challenges (Arsel, 2017).

Participants

The study participants included four hiring managers from manufacturing companies. Saunders and Townsend (2016) stated that study participants must possess sufficient scope and important information to provide in-depth, rich responses to the research questions. Study participants must also possess knowledge and experience germane to the phenomenon under exploration (Patton, 2015). The criteria for the study participants was employment as a hiring manager in a manufacturing industry and sufficient knowledge of strategies to recruit skilled production workers.

I gained access to participants by using the State Chamber of Commerce members' directory to identify manufacturing companies. I emailed hiring managers an invitation to participate in my study. After the manager voluntarily agreed to participate in my study, I established a relationship with the manager to gain access to necessary information to answer my research questions. Once a relationship was established, I

emailed a letter of voluntary cooperation to the hiring manager to be signed and returned to me with contact information.

The establishment of trust with participants is crucial for good research (Celestina, 2018). Celestina (2018) stated that it was important to ask at what level the participants trust and distrust the researcher. I fostered a working relationship with participants by being open and transparent and briefing the participants on the purpose and guidelines of the study.

Research Method and Design

Research Method

The qualitative method is appropriate to explore the strategies for recruiting skilled production workers. By using interviews and observations, qualitative researchers obtain facts and provide comprehensive knowledge about the phenomena under scrutiny (Annansingh & Howell, 2016). When conducting qualitative research, the researcher seeks to understand the process regarding the phenomena under study (Al Marzooqi, 2015). Quantitative researchers use data from survey instruments and experimental investigations to test hypotheses and analyze cause-and-effect relationships among variables (Annansingh & Howell, 2016). Quantitative researchers analyze numerical data to determine relationships between variables and outcomes (Rutberg & Bouikidis, 2018).

Researchers use the mixed method to combine analysis and quantitative and qualitative data-collection techniques (Annansingh & Howell, 2016). To explore the strategies that hiring managers use to acquire skilled workers, I did not test hypotheses, which is appropriate in the quantitative method and the quantitative portion of a mixed

method study; therefore, I chose neither the quantitative method nor the mixed method for this study. The qualitative research methodology was appropriate for this study because the participants could share their experience with recruiting skilled production workers in a semistructured interview.

Research Design

A multiple case study design was appropriate to explore strategies that hiring managers used to acquire skilled workers. Aczel (2015) noted that case study design is used to explain a circumstance and investigate firsthand phenomena in real-life settings. Case study research is relevant when the researcher seeks to incorporate a comprehensive method using several data collection techniques and analytical approaches to answer *what* and *how* questions regarding phenomena (Dresch, Lacerda, & Miguel, 2015). Phenomenologists focus on participants' interpretations of lived experiences; therefore, phenomenology was not an appropriate design for this study because the key method I used to collect data was the interview (see Annansingh & Howell, 2016; Tight, 2016). When conducting an ethnography, the researcher seeks to understand people and cultures (Al Marzooqi, 2015). The ethnographic design was not appropriate because culture was not the only area I explored for this study. Researchers use case studies to draw on experience and strengthen information from other researchers (Annansingh & Howell, 2016). I conducted interviews and reviewed company documents to explore successful recruitment strategies until I no longer discovered new information, thus reaching data saturation. Therefore, a case study design was appropriate to explore strategies in recruiting skilled production workers.

Population and Sampling

The population for this study included multiple manufacturing hiring managers of companies within Southeastern North Carolina who had implemented successful strategies to recruit skilled production workers. I selected a sample of participants using the purposeful sampling method. Purposeful sampling is used in qualitative research to identify and select cases relevant to the phenomenon of interest (Palinkas et al., 2015) and is the most often means of sampling (Gentles, Charles, Ploeg, & McKibbon, 2015). Researchers chose participants who will be able to share substantial knowledge, experiences, and documents to assist with the research (Etikan, Musa, & Alkassim, 2016). Patton (2015) asserted that researchers use purposeful sampling to access information-rich cases to gain important knowledge of the research topic. Purposeful sampling can be useful when the researcher has few resources and limited time and workforce (Etikan et al., 2016).

The eligibility criteria for participants was that they were manufacturing hiring managers who successfully recruited skilled production workers to meet the demands of industry. I conducted interviews in a setting in which the participants were comfortable at their work location. Researchers have empirically demonstrated that physical environments can influence interview outcomes. Dawson, Hartwig, Brimbal, and Denisenkov (2017) observed that a person who is interviewed in an open, spacious setting discloses more information than someone who is interviewed in a small, closed setting.

A researcher conducts interviews as one method to reach data saturation (Fusch & Ness, 2015) and can consider a sample size of three as sufficient for a case study (Yin, 2018). Saturation occurs when the researcher no longer discovers information that addresses the research topic (Malterud, Siersma, & Guassora, 2015). I conducted interviews and reviewed company documents to explore successful recruitment strategies until I no longer discovered new information. In a study in the Florida Panhandle, saturation was reached when the researcher determined that the continued collection of further data would provide minimal or no additional information relevant to the research question (Morse, Lowery, & Steury, 2014).

Ethical Research

Researchers use the informed consent process to explain the steps implemented to assure the ethical protection of participants. The informed consent process consists of transparency, understanding, free choice, and permission (Longo & Grady, 2015). Researchers must be knowledgeable of possible ethical conflicts involving the treatment of participants. The individual researcher, individual review boards, and research communities are responsible for ethical research (Caruth, 2015). Ethical research requires that potential study participants voluntarily consent prior to the beginning of the study. The researcher explains in writing to the participant the risks, benefits and other specifics of the study to assist with the decision to participate (Lentz, Kennett, Perlmutter, & Forrest, 2016).

An informed consent is a legal requirement specifically focused on the participants' statement of their reasons for engaging in the study (Lie & Witteveen,

2017). The informed consent document provides participants with important information about the study (Lentz et al., 2016). The consent document includes the reason for the study, data collection methods, expected risks, and the benefits of participation. Lie and Witteveen (2017) posited that informed consent clarifies the data collection purpose, how the information obtained is used, participant's rights, risks, and benefits, and documentation that the participants understand and consent to engage in the study. A primary information source for participants is the informed consent process (Brehaut et al., 2015).

I reviewed the consent form with participants prior to the interview and ensured that participants received a copy of the consent form providing their approval to participate in the study. Longo and Grady (2015) emphasized the importance of participants providing written consent. To abide by ethical guidelines, I informed the participants of their right to withdraw from the study at any time without fear of any negative consequences or reprisals. Participants understood the option to contact me by email or telephone to request withdrawal from the study. If a participant withdrew, I would destroy their information. Participants were not offered financial or any other incentive(s), thus removing incentives from possible ethical consideration. At the conclusion of my research study, I will provide a brief summary of the results to stakeholders.

Protecting the identity of participants through anonymity is imperative to guaranteeing confidentiality (Lancaster, 2017). Protected participants may more confidently offer more in-depth information. I used a combination of letters and numbers,

such as PL1, PL2, and PL3 to safeguard the identity and confidentiality of the participants and protect the name through a labeling method, using letters PL. To protect the confidentiality of participants, I have sole access to all research data, which I will maintain in a secure file cabinet for a minimum of 5 years, after which time I will destroy the data by shredding and deleting files. I applied for an IRB approval (Approval number: 11-05-18-0669402) from Walden University before commencing data collection for my research.

Data Collection Instruments

In a qualitative study, the researcher is the primary data collection instrument (Fusch & Ness, 2015; Twining, Heller, Nussbaum, & Tsai, 2017). As the primary data collection instrument, I conducted semistructured interviews to explore strategies to recruit skilled workers. Interviewing is a qualitative data collection method where participants are asked preset open-ended questions reflective of experiences, perceptions, and knowledge on the research topic (Dabic & Stojanov, 2014; Rutberg & Bouikidis, 2018). Qualitative researchers develop open-ended questions to allow interviewees to contribute their perspectives and answer follow-up questions to provide in-depth details regarding the interviewees' experiences (Dikko, 2016). Using open-ended questions allowed participants to provide answers in their own words, reflecting their opinions about investigated events (Dabic & Stojanov, 2014; Rutberg & Bouikidis, 2018), add credibility, and reduce personal bias. The benefit of using non-leading questions was to further minimize bias related to how a question is formulated (Watts et al., 2017).

An interview protocol (see Appendix A) is a description of my interview listing key points of my study and initial questions. Interview protocols include a brief case study summary, an explanation of data collection procedures, and an opportunity for the interviewee to ask questions (Arsel, 2017). The researcher increases the reliability of case study research by using the protocol in the data collection process (Yin, 2018). I used different participants in different settings and offered participants the option to provide input on transcripts and preliminary study findings. Member checking and triangulation contribute to the credibility and trustworthiness of a study (Twining et al., 2017). I also used a digital voice recorder to record interviews of each participant to identify chief themes. Participants provided written consent to record the interviews. During the interviews, I asked the participants to provide any available documents explaining the organization's recruitment strategies. I reviewed interview transcripts and notes, organizational documents, and my observations, to triangulate the data in the study. Transcript reviews by participants reinforced the reliability of the data collected. Triangulation is a technique used to increase credibility in the research study (Varpio, Ajjawi, Monrouxe, O'Brien, & Rees, 2017).

Data Collection Technique

The data collection in this research study involved semistructured interviews as the primary data collection technique and company document reviews as the second data collection technique. In semistructured interviews, the researcher uses pre-determined questions but can adapt the questions to each participant, adding follow-up inquiries dependent upon the participant's responses to the questions (Arsel, 2017). I conducted

semistructured interviews following the interview protocol. Rutberg and Bouikidis (2018) posited data collection techniques as methodological triangulation to enhance credibility and trustworthiness. The use of open-ended interview questions (see Appendix B) allowed participants the time to explain strategies used to recruit qualified workers.

I contacted company human resource managers to schedule the interview in a conference room within the manufacturing company. I reviewed the informed consent with the participant prior to beginning the interview process. I utilized a voice recorder to record the participant's answers to supplement my hand-written notes.

Ensuring reliable and valid data are collected from participants is essential. I used member checking to verify information from participants. Member checking is following up with participants to ensure the findings accurately reflect their experiences (Kornbluh, 2015). In member checking, participants review interview notes with a brief synopsis of the findings from the interview and the researcher may ask further clarifying questions to solidify data collection (Kornbluh, 2015). I allowed the participants an opportunity to confirm the interpretation of the findings. A transcript review was used to gain feedback on the written transcription of the participant data, and this process yielded no changes to the original data collected from participants. With methods triangulation, the researcher uses several data collection methods to obtain a fluent and complete view of the research topic (Rutberg & Bouikidis, 2018; Varpio et al., 2017). Verifying the research interpretations with participants increases the credibility of the findings (Korstjens & Moser, 2018).

Data Organization Techniques

I used a coding process to organize the data obtained from the participant interviews and reviewing company recruitment documents. Britton, Pieterse, and Lawrence (2017) defined coding as analyzing data to identify themes or patterns. The coding process is helpful because the researcher can identify each theme shared by the participant (Fletcher, 2017). Researchers understand the vital importance of coding qualitative data to ensure research trustworthiness credibility and member checking (Britton et al., 2017). I stored data collected from each participant during the interview process and after follow-up interviews in an electronic folder to maintain confidentiality. According to Lancaster (2017), confidentiality and anonymity are important to maintaining the trust between the researcher and the participant. According to Caviglione, Podolski, Mazurczyk, and Ianigro (2017), cloud storage applications are widely used to access resources with Dropbox outperforming AppleiCloud, Microsoft OneDrive, and Google Drive. I designated each folder with a special label for each participant, L1, L2, and L3. I used folders to organize unprocessed data and will not share this information with the participants. I will maintain the data securely for 5 years according to the policy on retention of research data.

Data Analysis

Qualitative data analysis allows the researcher to collect raw data for examination and comparison (Dabić & Stojanov, 2014) and produce transcripts and field notes (Zamawe, 2015). Central steps of the data analysis process included data collection, data reduction, and coding or categorization (Graue, 2015; Ji Young & Eun-Hee, 2014). The

purpose of data analysis is to discover patterns which answer the research question. I collected data by asking the participants six open-ended questions during semistructured interviews and reviewing organizational documents. The researcher focuses on trustworthiness to ensure the quality of qualitative data (Olivier, 2017). The use of triangulation saturation enhanced the quality and trustworthiness of the study (Ji Young & Eun-Hee, 2014; Varpio et al., 2017). In exploring the experiences of radiographers in Gauteng, South Africa Britton et al. (2017) achieved triangulation of the data by merging the interview data collected with the data received from the researcher's reflective field notes penned throughout the research process.

In conducting evaluations, the researcher can use four forms of triangulation: (a) data triangulation, (b) investigator triangulation, (c) theory triangulation, and (d) methodological triangulation (Graue, 2015; Yin, 2018). Investigator triangulation involves two researchers collecting and analyzing data, which is not appropriate for this study. In data triangulation, the researcher collects data using different sampling strategies. The researcher interprets data using at least two theoretical positions in theoretical triangulation. In this case study, I applied the human-capital theory. In methodological triangulation, the researcher collects data using at least two methods (Graue, 2015). I used methodological triangulation and collected data through semistructured interviews and company document reviews pertinent to successful recruitment strategies such as job advertisements and company websites.

Researchers may analyze the interview data with the aid of a Microsoft Excel spreadsheet or Nvivo software. Wali, Uduma, and Wright (2016) used Nvivo software to

help validate that the themes truly emerged from the study and not from the researchers' biases. Zamawe (2015) maintained that high compatibility to research designs was a strength of the NVivo software. I coded the common terms and word associations from the interview data and company document reviews during data analysis until the themes emerged.

Reliability and Validity

Reliability

Yin (2018) defined reliability as a subsequent researcher reaching the same conclusions and findings as the previous researcher when conducting the same study over again following the same procedures. Reliability and validity strategies are crucial within qualitative research to ensure the validity and trustworthiness of study results (Cypress, 2017). Dependability refers to when another researcher can replicate the study findings with a similar but different sample of participants (Korstjens & Moser, 2018). To ensure dependability, qualitative researchers outline their methodology so other researchers can replicate their study (Constantinou, Georgious, & Perdikogianni, 2017). One key task of the researcher is to maintain documentation of coding decisions and use memos to reference recoding and labeling changes during the development process (Bengtsson, 2016). Cypress (2017) defined member checks and triangulation as important methods to ensure the quality of study findings. I used member checking and triangulation to ensure dependability.

Validity

Credibility is the precise recording of the participant's responses (Cypress, 2017). Credibility is achieved when the researcher applies the appropriate research methods and connects with the culture by visiting the company site (Olivier, 2017) and when the results demonstrate engagement, methods of observation, and audit trails (Korstjens & Moser, 2018). To obtain credibility, the researcher ensures the inclusion of pertinent data (Bengtsson, 2016). Participant agreement also helps to ensure credibility of the study findings. Using methodological triangulation, researchers apply multiple data collections methods to enhance the credibility of the study (Varpio et al., 2017). I collected and analyzed data from multiple sources to increase the credibility of my study.

Confirmability refers to the researcher denoting that the findings emerged from the responses of participants and not from the biases or viewpoints of the researcher (Korstjens & Moser, 2018). Researchers also ensure confirmability by developing thorough daily field notes before and after completing the interviews (Britton et al., 2017). Bengtsson (2016) and Olivier (2017) referred to confirmability as the objectivity or neutrality of the data. To ensure confirmability, I maintained electronic documents throughout the research process and remained conscious of personal biases which may affect study findings and conclusions. After each interview, I prepared detailed field notes from each participant. Data saturation occurs when the researcher ceases to learn new information or themes related to the research question and has sufficient in-depth information to describe the phenomena under study (Constantinou et al., 2017). During data collection, I checked for data saturation by examining and coding participant data.

Bengtsson (2016) and Olivier (2017) referred to transferability as the level which the results may apply to other settings or groups and to the number of participants. Transferability allows the reader to decide if the findings are relevant to individuals outside of the study (Korstjens & Moser, 2018). Britton et al. (2017) ensured transferability by presenting descriptive data comparisons with another population or setting. Cypress (2017) used the purposive sampling method with in-depth information from participants to enhance transferability. To address transferability, I recruited participants who were hiring managers to address the research question under study.

Transition and Summary

In Section 2, I described the purpose of this research study, the role of the researcher, the participants, and population and sampling, as well as the methods and processes, used to collect and analyze data. I addressed dependability, credibility, confirmability, and transferability. The purpose of this qualitative case study was to explore strategies used by hiring managers to recruit skilled production workers. I interviewed hiring managers and reviewed company documents related to recruitment strategies. I collected data through interviews and company documents until I reached data saturation. I analyzed data collected from the interviews and company records and organized using codes. In Section 3, I present the findings from the research, application to professional practice, implications for social change, recommendations action, and recommendations for future studies. Section 3 also includes a summary and conclusion.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative multiple case study was to explore strategies to recruit skilled workers in manufacturing. In this section, I present my findings and discuss the themes identified. I also discuss application to professional practice and implications for social change and provide recommendations for action and further research, personal reflections, and my conclusions.

My findings included six themes for the successful recruitment of skilled workers in manufacturing: (a) fuel competition for local labor market, (b) enhanced advertising methods, (c) networking, (d) providing job training, (e) growing their own talent, and (f) building new perceptions of manufacturing. Participants agreed that competition for local labor is critical when recruiting skilled production workers. Participants competed for a limited labor force, where the people were good, but in short supply. Participants advertised vacant jobs through online websites, internal postings on human resource boards, supervisor recommendations, and help wanted banners and billboards. To build collaborations and partnerships with businesses, the community, educators, and elected officials, participants emphasized the value of networking. Participants confirmed that students and workers have access to job training programs to prepare for positions. The critical need to develop a pipeline of skilled job applicants to support recruitment strategy was recognized by all participants. Last, building new perceptions of manufacturing was deemed essential to ensure future recruitment of skilled production workers and sustainability of the manufacturing industry.

Presentation of the Findings

The central research question for this study was as follows: What strategies do some managers of manufacturing companies use to recruit skilled production workers to sustain business profitability? Through interviews with manufacturing managers who successfully recruited skilled production workers to sustain business profitability, I identified six themes and present them in the following pages. Human capital theory as mentioned by Sweetland (1996) comprised the conceptual framework for this study. I describe how the findings confirm, disconfirm, or extend knowledge and connect the findings to the conceptual framework used for this study. I used methodological triangulation by collecting data through interviews and company document reviews of information from participant websites. The interview participants had a combined total of more than 50 years of business and manufacturing experience. The participants' consistent answers to the research questions combined with the conceptual framework, literature review findings, and triangulation enabled me to identify the six themes during data analysis.

Theme 1: Fuel Competition for Local Labor Market

Competition for local labor was the first key theme that emerged from the data analysis. Čiutienė and Railaitė (2015) defined human capital as knowledge, skills, abilities, and other traits of individuals that contribute to organizational productivity, which is the conceptual framework for this study. Participant PL3 said, "Different companies are all fighting for the same group of workers, and this standard answer will

be shared by other companies" and "The challenge is competing for a limited labor force, where the people are good, but there are not enough of them." According to Schiemann et al. (2018), with the U.S. unemployment rates near 5%, manufacturers are experiencing major challenges in attracting, developing, and retaining key talent. In my examination of the participating companies' websites, I identified listed positions advertised for similar skillsets. This theme also confirmed the findings of Irshad (2016) and Holzer (2017). Irshad asserted that the shortage between the demand and supply of talent will likely continue to increase for highly-skilled workers. Labor markets remain tight locally and throughout the country (Holzer, 2017).

Participant L2 (PL2) added, "competition in the area now makes it more difficult to find local talent with technical or mechanical aptitude or prior experience doing the work at another organization." Jobs in advanced manufacturing and other fields requiring more skill are growing (Holzer, 2017). The unemployment rate for the second quarter of 2018 was down below 4%, according to Holzer (2017). PL2 explained that to get the right people, recruiters must expand beyond the geographic region.

Participants followed company recruitment plans. Participant L1 (PL1) commented that "one strategy focused on educating middle school students all the way through college on jobs available in the manufacturing industry." PL2 added that "talent acquisition agreements existed between recruiters and hiring managers and annual operating plans were tied to budgets and headcount plans." Participant L3 (PL3) explained that every morning, a senior manager in charge of production met with human resources and shared the list of needed workers, for instance, general assemblers,

technicians, or team leaders. This strategy allowed team members to focus on real-time worker needs daily while guiding the direction of the recruitment plan and process. Sahay (2015) affirmed that executives apply Just-in-Time recruiting to provide hiring clients with the best candidates with the right skills at the right place. Therefore, this theme aligns with the human capital theory in that the uniqueness of human capital refers to the degree to which an individual's skills are rare, specialized, and firm-specific. Table 1 contains related statements made by the participants on fueling competition for the local labor market.

Table 1

Theme: Fuel Competition for Local Labor Market

Participant	Participant comments
L1	Location is the number one problem followed by branding. Involved with local Chamber of Commerce and regional economic development alliances. Focuses on re-branding as the name of the company has changed. Gets company name out there by making students aware company exists, getting out into classrooms, mentoring kids, providing tours letting them know about the business. These are our biggest opportunities.
L2	There is a lot of in-fighting in terms of getting local skilled talent. Lots of competition from company to company, sometimes with workers hopping back and forth between plants. We seem to be doing more harm than good. Compensation is right, and for this area it is excellent. Recruiting from other areas is more difficult due to location being in a rural area, even from a city 1½ hours away for the exact same job.
L3	Difficulty is company operates within a large agrarian, fishing, and boat-making geographic area. The industrial base is growing with other facilities popping up all over for the past 21 years. Few of the people have worked in industry.

Theme 2: Enhanced Advertising Methods

Participants used similar advertising methods to recruit potential employees. Recruitment refers to methods by which a company advertises positions, occupations, or organizational information to applicants (Campion et al., 2017). All participants posted jobs to online websites, which included Career.Builder.com, Indeed.com, Linked-In, and Monster.com, thus validating the theme posited by Anderson (2017) that hiring managers relied on online resources as a primary recruitment venue for human capital. PL3 stated, "company uses Indeed.com, Monster, Inc., and state job websites that applicants can pull up on their phones and focused on websites which have attracted successful hires." All participants advertised some positions internally to encourage upward mobility and cross-training of employees. PL1 stated that they "incorporated networking into recruitment strategies using job and technology websites, employee's referrals, alumni associations, colleges, Science, Technology, Engineering, and Math Boards, and Chamber Boards, and in 2018, for the first time, filled 75% of engineering openings." This theme also aligns with Kolomiiets's and Golovkova's (2017) definition of human capital as skills, knowledge, and experience individuals bring to their workplace effectively used to increase revenues. PL1 also added the importance of encouraging graduate interns in underemployed and vulnerable populations to seek positions with the company.

PL2 shared that they "advertised through the normal performance management cycles where managers identify the development needs and desires of employees to help them move up in the organization." PL2 also reported placing advertisements with newspapers, the Department of Commerce, recruiting firms, college and university career

fairs, and career fairs targeting military talent. PL3 displayed large help wanted banners in front of the company and confirmed that this was a very effective advertising method. PL3 affirmed the success of job fairs as an effective recruitment strategy, which generated a 60% hiring success rate. Companies display help wanted signs of various sizes at the business and advertise for help on large billboards, which is a common practice. Sandborn and Prabhakar (2015) confirmed that as aging workers approached retirement, businesses faced a diminishing labor pool of qualified job applicants. Sahay (2015) stated that competent talent was critical to creating new products and services and innovative ways to improve business operations. Anderson (2017) proposed a human capital network to measure applicant skills as online marketplaces increase in significance in matching workers to employers, further aligning with this theme. In my company document review, I identified positions advertised on participants' websites and on the Human Resources board at one site. Table 2 includes statements made by the participants related to enhanced advertising methods.

Table 2

Theme: Enhanced Advertising Methods

Participant	Participant comments
L1	With over 25 years of Human Resource experience, have done a good job with this. Putting blood, sweat and tears into it, can't just wait for it to happen. Including strategic workforce planning to prepare the future workforce.
L2	One is internal postings which lets employees know about positions if they have aspirations that they have not previously expressed. Have over 100 jobs currently posted for just one site.
L3	Posts non-exempt jobs internally on the Human Resources bulletin board. New applicants can visit company, complete a paper application and turn in at the site. Does not use print newspapers due to low readership and expense.

Theme 3: Networking

Participants emphasized the value of effectively networking to successfully recruit skilled production workers. Teodoro and Switzer (2016) stated that manufacturers attempting to improve performance should consider human capital development options through collaboration and partnerships. Each participant developed partnerships with the economic development commission, chamber of commerce, community college and university systems, which aligns with the human capital theory. PL1 explained "the development of multi-level partnerships with businesses, the community, and educators for the purpose of maintaining a workforce ready talent pool." In further alignment with this theme, Kim and Park (2018) stated that establishing a quality educational system to

increase human capital was vitally important in improving productivity growth. PL1 also "Incorporates the importance of networking into recruitment strategies: internal employee's referrals, alumni associations, colleges, community contacts, technology and Chamber Boards."

PL2 collaborated with school systems, community colleges, external recruiting firms and local realtors. PL2 also emphasized the importance of sharing study results with business associations, community college leadership, workforce development boards, and other audiences serious about addressing local labor needs and implementing proactive steps. PL3 emphasized the importance of networking with visits to adjacent counties when businesses closed and recruiting workers who had lost their jobs. Six county economic development organizations have proposed a Regional Advanced Manufacturing Pipeline project to assist manufacturing companies in addressing the critical shortage of available skilled workers. Strategic partners collaborating include middle school, high school, and community college educational professionals and industry contacts. Holzer (2017) stated that collaborations were key to generate employer confidence in the quality of students referred for work-based learning opportunities and over time in the workers' developing skills and in overcoming workers' lack of documented work experience, which validates this theme. The methodological triangulation of the interview data and information from the participating company's websites such as "our emphasis on collaboration and internships and co-op work opportunities" and "networking and connections" validates the network theme.

In 2015, the North Carolina State Board of Community Colleges adopted an Align4NCWorks Strategic Plan. The aim of Align4NCWorks, a Plan of Plans for Collaborative Workforce Development, is to ensure that North Carolina is #1 in workforce. Posted on the North Carolina Community Colleges website and in the Strategic Plan, the Community College System acknowledges the concept in the North Carolina Chamber's strategic plan that students leave community colleges with job-ready credentials. North Carolina's goal is to lead successful employees and employers in a global economy. Connecting students to quality careers and employers to quality employees is goal two in the Align4NCWorks Strategic Plan. Eight goals are listed on the North Carolina Community Colleges website and in the strategic plan.

Colleges shared best practices at Align4NCWorks Workforce Learning Summits. One community college continues to recruit, screen, and train aerospace workers since a new composite manufacturing plant opened in 2010 bringing good jobs to rural, Eastern North Carolina. Collaboration is the key to the North Carolina Community Colleges' success in workforce development. Community Colleges respond to employer needs and aligns workforce development systems by strengthening partnerships among business and industry, workforce development boards, public schools, economic development, elected officials, local government leaders, community organizations, and other partners.

Theme 4: Providing Job Training

All participants stated that job training supported recruitment of skilled production workers. Becker emphasized that education and training were the most important investments toward increasing human capital (Kaiper, 2017). PL2 established

partnerships with higher education, state agencies, and private companies to provide a training platform for applicants who demonstrated technical aptitude. Angelopoulos, Malley, and Philippopoulos (2017) indicated that human capital increased labor productivity and enabled worker transition to skilled employment. According to Zouaghi, Sanchez, and Martinez (2018), human capital, education and skills and training policy enables individuals to support innovations to ensure businesses survive intense competition. PL1 added that "school systems are unequipped to be successful alone. Businesses can play a critical role by offering real-world applications linked to the concepts that educators teach in the program lesson plans." Boeing Aircraft Company established agreements with 29 high schools and 24 community and technical colleges in the state of Washington to align training programs with job openings in efforts to ensure the future of manufacturing (Rosendin & Gielczyk, 2018), therefore validating this theme.

PL3 stated that "companies who advertise for workers with one year or more of manufacturing experience will not fill those 100 positions in six months, and are setting themselves up for failure expecting today's workers to have manufacturing experience. It is very important that a company trusts its internal training program. Simply because applicants have not followed the same decisions of parents and grandparents who decided to work in the manufacturing industry. Companies must take a chance, hire, and train today's workers. Company offers an extremely difficult technical training program to run automated assembly lines at the lowest technician levels." The methodological triangulation of the interview data and information from the company websites such as

"workforce recruitment and customized training opportunities" and "we emphasize continuous learning and developing from within" supports providing job training as a successful recruitment strategy. Holzer (2017) stated that a related approach is for students to follow career pathways through a sequence of progressions that include achieving stackable credentials and work experience, which also aligns with this theme.

Theme 5: Growing Their Own Talent

All participants recognized the critical need to develop a pipeline of skilled job applicants to support the successful recruitment of skilled production workers. PL2 stated that the company promotes internal workers to front-line supervisors. PL3 added that "Company is looking for good applicants, who will come to work every day and are trainable." Hamilton and Davison (2018) recommended that managers focus more on the future skills and knowledge of applicants over current identifiable knowledge, skills, and abilities, thus aligning with the human capital theory. PL1 developed a Science, Technology, Engineering, and Mathematics (STEM) Education Program to encourage early student interest in STEM jobs to prepare students for entry into the future workforce. Early engagement for middle school students included hosting Manufacturing Day, plant tours, virtual classes and business mentoring. PL1's phased approach to educate and reinforce high school students incorporated mentoring, internships, scholarships, and tours. To recruit and retain talent at the college level, PL1 recommended business alliances with colleges and universities, internships, campus appearances (career days, lunch and learns, College of Engineering Visits), scholarships,

capstone, and tours. Television and newspaper reporters provided coverage of the STEM program and events.

PL2 commented that "We need to grow our own talent as they are coming up through the school system and community colleges." One college's best practice shared at Align4NCWorks Workforce Learning Summits highlighted seamless education: a district-wide early college approach from Pre-K to college. Partnering with county schools, the college embraced students as young as four years of age through the "Crayons on Campus" initiative. The college scheduled students for on-campus tours, provided lunch, and their own college identification badge complete with their photo. The community college implemented a "rare collaborative educational and workforce effort to reach students at the beginning of the educational and career pipeline." Holzer (2017) posited that the most important training will occur in career and technical education programs in the high schools and community colleges, which validates this theme. The participant companies were active in growing their own talent as evidenced by the information on the websites, such as "committed to education, individual and organizational development, career planning, and performance management" and "you can maximize your knowledge and experience in an environment that encourages growth." Dombrowski et al. (2016) asserted that companies' lack of manufacturing strategy was a neglected success factor for improving competitiveness. Table 3 contains statements made by the participants on growing their own talent.

Table 3

Theme: Growing Their Own Talent

Participant	Participant comments
L1	Developing strategies and building partnerships to best prepare students for entry into the future workforce. Recognize millennials or we will lose these kids, and we will have no one to run this technology or these machines.
L2	Worker's with a two-year or four-year college degree can start out on a production line in a skilled job. They will learn something, and if they have aspirations will be able to move up in the company.
L3	Company provides excellent on-the-job training. If applicant has a good, continuous work record with Burger King or McDonald's in fast food, company will train them as an assembler.

Theme 6: Building New Perceptions of Manufacturing

During the interviews, all participants agreed on the necessity to dispel the old perception of manufacturing as a low-skilled, low-tech job to successfully recruit skilled production workers. Companies have the vision to grow their own talent and focus on underemployed workers to help prepare them for available jobs in manufacturing. The desire was to take proactive steps and work together to address strategies beneficial to all parties. Kianto, Saenz, and Aramburu (2017) indicated that human capital was a key enabler in firm innovation, aligning with the human capital theory. Stakeholders educate the public and workers that manufacturing in the 21st century is not their grandfather's job; but very different work. The concept of smart manufacturing in the USA advances

computerization, cloud computing, Internet of Things (IoT) and cyber-physical systems in manufacturing (Brad, Murar, & Brad, 2018). All participants in this study were employed by companies who managed global operations. PL3 stated that "Robotics are primarily at this site and the company has plenty of work." Ogbemhe et al.'s (2017) findings confirmed that robotics created employment instead of reducing jobs, with 1.9-3.5 million new jobs projected in the next 8 years, which aligns with this theme.

Hiring managers are unable to fill vacant positions. PL1 commented that "Slowly but surely it is happening – starting to see it now…. 5-10 years ago, no one wanted to hear about recruitment strategies. They could not see how it affected the bottom line of the company." Each participant affirmed that the inability to recruit skilled workers affected profitability. The methodological triangulation of the interview data and the links to the information on "technology, careers, and presentations" located on the participant company's professionally designed websites supported this theme. PL3 added "Difficulty in having recruitment is a double-edged sword. If we weren't having difficulty recruiting, it could mean the company isn't growing. As tedious as it is to recruit, it is better to have that problem, than to be stagnated and to not have this problem." Kusiak (2018) affirmed that community jobs are sustained with the preservation of manufacturing jobs, and numerous researchers have focused attention on smart manufacturers (Thoben, Wiesner, and Wuest, 2017). PL2 commented that "except for the very entry level positions in packaging, all workers are considered skilled." PL1 commented that strategic planning was critical to address the silver tsunami or graying of

the workforce and the current educational system. Table 4 contains a summary of related statements made by the participants on building new perceptions of manufacturing.

Table 4

Theme: Building New Perceptions of Manufacturing

Participant	Participant comments
L1	Company needs modification technicians, electronic technicians, welders, and leaders. Company is still doing well now, but if 28% of your workforce has over 25 years of experience, who will retire soon? What will the workforce look like in the future? Who will run these machines? Technology is rising, and who will develop future automation?
L2	Regarding assembly work, we must dispel the old perception of manufacturing that it is a low-skilled, low-tech job today. Assembly line workers must use analytical skills to understand how equipment operates and to troubleshoot problems. There is lots of math involved and documentation must be accurate. When the Food and Drug Administration comes in to audit, they may come to a worker and ask a question about the machine or the product.
L3	Company needs workers with technical and troubleshooting skills, maintenance, and simple repairs is extremely difficult to find in area. Robotics are primarily at this site, and we experience difficulty hiring technicians to repair equipment. Material handlers have weight requirements, and worker dexterity of hands is required for some assembler positions. Skills sets vary. We have plenty of work, and the economy has taken off.

Applications to Professional Practice

The result of the study could prove valuable to current and future manufacturing hiring managers for improving or developing recruitment strategies for skilled production workers, resulting in a more skilled human capital pool and increased community and industry partnerships. Therefore, manufacturing business leaders can improve their business performance by applying the findings from this study. Business practice may be improved as strengthened workforce skillsets can determine product quality and service, enhance business sustainability and profitability and job security of workers. The study findings include six themes: (a) fuel competition for local labor market, (b) enhanced advertising methods, (c) networking, (d) providing job training, (e) growing their own talent, and (f) building new perceptions of manufacturing. Industry leaders could use the study findings as a recruitment tool for aligning job applicant skillsets to industry positions and educating the public on the lucrative careers available in manufacturing. In the human capital theory, researchers have proven that intellectual capital positively influenced firm performance (Hashim et al., 2015) and generated organizational value through innovations (Bacila & Titu, 2017). The findings may contribute to an increased awareness of the collaborative planning between manufacturing leaders and educational professionals in identifying and directing students early in the educational processes and career development stages. Additionally, the findings may encourage business leaders and hiring managers to assess their organization's recruitment strategies and consider alternatives which may improve organizational performance. The finding of this study may assist economic development organizations in attracting new businesses and

encouraging employers to add jobs and expand operations in communities. Manufacturing leaders may be encouraged to continue collaborations with all stakeholders to ensure successful partnerships supporting recruitment initiatives.

Implications for Social Change

Using the result of this study could help to improve recruitment and performance of the manufacturing businesses. Hiring managers can apply the findings of this study to develop or improve recruitment strategies for skilled production workers in manufacturing and other industries experiencing worker shortages. In southeastern North Carolina, manufacturing industries contributes to the local and national economy as major employers. Therefore, the sustainability and profitability of the industry are critical to the individuals and communities where jobs are located. Managers may have a better understanding of recruitment strategies which lead to increased matching of worker job skills with vacant jobs in industry. Human capital theory emphasized increasing the national employment and individual income and educational relationships (McClanahan, 2017). Other implications for social change include promoting company sustainability and profitability, thereby allowing organizations to give back to the community. Skilled employees earn higher incomes to provide for their families while contributing to the community and local economic stability, therefore possibly avoiding negative social dilemmas. Employed workers with regular incomes support community businesses, allowing for improved resources and stability for families. The result of the study can help fill the gap of knowledge of what strategies to implement to recruit skilled

production workers and encourage leaders to strengthen collaborations and critical partnerships to develop a viable workforce.

Recommendations for Action

The purpose of this qualitative multiple case study was to explore strategies that hiring managers of manufacturing companies used to recruit skilled production workers to sustain business profitability. Based on the findings of this study, I propose several actions that the current and future manufacturing hiring managers can implement to improve their recruitment strategies of skilled production workers to sustain business performance and profits. The hiring managers should understand six key themes for the successful recruitment of skilled workers in manufacturing: (a) fuel competition for local labor market, (b) enhanced advertising methods, (c) networking, (d) providing job training, (e) growing their own talent, and (f) building new perceptions of manufacturing.

First, hiring managers should utilize enhanced advertising methods to ensure job vacancy notifications reach all interested and qualified workers, extending recruitment efforts beyond the local geographic areas. Second, managers should include the effectiveness of networking, collaborations, and partnerships with crucial stakeholders regarding recruitment success initiatives. The ability of a firm to recruit skilled workers is necessary for business sustainability and profitability. The increase in manufacturing operations and global competition has contributed to the shortage of skilled labor. Third, manufacturing companies should ensure the availability of adequate job training programs for workers. Hiring managers experience a shortage of skilled workers while encountering the lowest unemployment rates in the United States. Fourth, hiring

managers should consider growing their own talent to develop a qualified labor pool to fill current and future jobs. Because of an aging workforce and millennials, a small number of talented employees are choosing to work in the manufacturing industry. I recommend that hiring managers use this study as a tool to improve identified strategies to recruit skilled production workers, thereby sustaining business profitability. I intend to publish the study in scholarly journals and to share the results with business leaders in manufacturing, educational professionals, workforce development organizations, and business forums where business leaders discuss strategies for recruiting skilled workers to sustain business profitability.

Recommendations for Further Research

I conducted a qualitative multiple case study to explore the strategies that hiring managers in manufacturing used to recruit skilled production workers. One study limitation was that the findings may not be generalizable to all agencies in all locations because of the small sample size. The population for the study consisted of three cases in southeastern North Carolina. The small sample size is one of the limitations of this study, and the study is also limited to one geographic location. Future researchers may address the limitations of this study in several ways. Researchers can select a different location such as in a different region or state to generalize the findings. Also, future researchers may conduct similar studies to explore recruitment strategies among other organizations. Last, future researchers can use a mixed research method and conduct qualitative interviews on a larger population and use the quantitative research method to develop hypotheses to test recruitment strategy rates and the use of the themes identified in this

study. In efforts to replicate the findings of my study, the quantitative research should encompass a larger data analysis set.

Reflections

In this study, I explored strategies that hiring managers implement to recruit skilled production workers in manufacturing. My participant pool included contacting over 10 companies in three different counties. The participants who consented to participate in the research possessed vast knowledge in the field and displayed an evident passion for their work. For this experience, I am forever thankful. I developed a good relationship with participants, which was key to the member checking processes. To establish trust, I explained to the participants their rights and the confidentiality of the research. I used the interview protocol to make sure that I asked the same questions to each participant, including the follow-up questions. I did not expect that transcribing the audio recording would be a lengthy process and can confirm from my experience that transcribing the interviews required a vast amount of time.

I conducted semistructured interviews and acquired new knowledge interacting with the business leaders. I was very fortunate to have the opportunity to interview employers who maintain global operations. I understood that challenges existed with the recruitment of skilled production workers, but I had no preconceived ideas regarding the study topic. I relied on the data to answer the research question and maintained an unbiased position throughout the research process. Upon completion of my study, I plan to share the study findings with audiences interested in proactive steps to develop and train current workers and prepare the future workforce. I enjoyed meeting each

participant, who kindly and professionally shared their time and abundant knowledge regarding recruiting skilled workers for the manufacturing industry.

Conclusion

Manufacturing hiring managers experience a shortage of skilled production workers to fill vacant positions. Yet, manufacturing contributes almost $2.2 trillion annually to the United States' gross domestic product (Anid, 2018). As older workers approach retirement and technology continues to advance, the availability of skilled workers is in short supply. Holzer (2017) affirmed that jobs in advanced manufacturing and other fields requiring more skill are growing, and labor markets remain tight locally and throughout the country. Workers depend upon manufacturing jobs to provide for their families. Kusiak (2018) affirmed that community jobs are sustained with the preservation of manufacturing jobs. Society relies upon a vibrant manufacturing industry to support the economy. The six themes that developed from the study were: fuel competition for local labor market, enhanced advertising methods, networking, providing job training, growing their own talent, and building new perceptions of manufacturing. Hiring managers can assess their organization's recruitment strategies and consider alternatives which may result in added community and industry partnerships, a more skilled human capital pool, and business sustainability and profitability. Manufacturing leaders may be encouraged to continue collaborations with stakeholders to ensure successful partnerships supporting recruitment initiatives. Last, the finding of this study may assist economic development organizations in attracting new businesses and encouraging employers to add jobs and expand operations in rural communities.

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Appendix A: Interview Protocol

Interview: Strategies to Recruit Skilled Workers in Manufacturing

The face-to-face interviews began with introductions and an overview of the topic.

A. I informed the participants I was sensitive of their time and thanked them for their participation in the study.
B. I reminded the participants that the interview would be recorded, and the conversation would remain strictly confidential.
C. I started the recording, and I clearly spoke the participant's identifying code, and the date and time of the interview.
D. The interview lasted approximately 45-60 minutes to obtain responses for six interview questions and follow-up questions.
E. I explained the process for member checking, by contacting participants with transcribed data, to request their verification of the accuracy of collected information as soon as possible.
F. I confirmed that answers recorded were satisfactory to the participants and concluded the interview with a thank you for participating in the study.

Appendix B: Interview Questions

The questions for the interview are as follows:

1. What challenges have hiring managers in manufacturing companies experienced in recruiting skilled production workers?
2. What are manufacturing hiring managers' internal recruitment strategies?
3. What are manufacturing hiring managers' external recruitment strategies?
4. What skilled labor positions have hiring managers in manufacturing companies found most difficult to fill?
5. How does the recruitment of skilled workers affect profitability?
6. What additional information would hiring managers in manufacturing companies like to share regarding recruitment strategies?