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Technology Integration and Training in Small and Medium-Sized Manufacturing Enterprises

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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MS, Liberty University, 2010

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Business leaders' lack of effective technology strategies results in lower quality products in the machining industry. This multiple case study was an exploration of the strategies that machining industry business leaders in small and medium-sized enterprises (SMEs) used to implement technology training. The population consisted of 9 business leaders from 3 machining industry SMEs in the southeastern United States who had successfully used technology-training implementation strategies. The conceptual framework for this study was the reasoned action theory, as demonstrated through the technology acceptance model (TAM). The data collection process included semistructured interviews and organizational documentation. Data analysis was conducted following Yin's 5-step approach. Data were compiled and organized, disassembled into fragments, reassembled into sequence of groups, and interpreted for meaning. Methodological triangulation and member checking validated the trustworthiness of those interpretations. Three themes emerged from the data analysis: ensuring technology preparedness, delivering appropriate employee training, and overcoming barriers to implementation. The implications of this study for positive social change include the potential to establish a workforce with high technology skills that is prepared to provide an improved quality of life for themselves and their families.

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Dedication

First, I would like to dedicate this study to my amazing God who gave me strength to complete this educational goal. I also thank Him for allowing me this opportunity to better myself and increase my learning. I would also like to dedicate this study to my family and some close friends. Each of them pushed and encouraged me each step of the way. I want to thank them for their love, support, and patience. Without my God, my family, and close friends, I am nothing. With God, my family and my close friends, I can do anything.

Acknowledgments

First, I would like to acknowledge the members of my committee. Dr. Jorge Gaytan, Dr. Natalie Casale, and Dr. Mary I. Dereshiwsky. Without their support and guidance, I would have never completed this task. Each of them is the quintessential professional and demonstrates a true desire to have students succeed. Next, I would like to acknowledge my colleagues who lent an ear on many occasions and offered much support and encouragement along the way. Finally, I would like to acknowledge the organizations and participants who engaged in this journey with me. Without their input and responses, this study would not exist.

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Section 1: Foundation of the Study

One characteristic of American businesses is that each is a composite of different capabilities that determines its standing within a particular industry (Brunswicker & Vanhaverbeke, 2015; Jimenez, Machuca, Garrido-Vega, & Filippini, 2015). Different capabilities designed to assist with technology use may facilitate organizational leaders' abilities to achieve a higher standing within their industry and help them to create a competitive advantage (Brunswicker & Vanhaverbeke, 2015; Hori, 2011; Jimenez et al., 2015). Leaders may use those same capabilities as tools to assist in developing organizational strategies focused on increasing profit (Brunswicker & Vanhaverbeke, 2015; Hori, 2011; Jimenez et al., 2015). The implementation of comprehensive technology-training strategies depends upon the knowledge level and leadership qualities of the organization's leaders (Brunswicker & Vanhaverbeke, 2015; Jimenez et al., 2015).

Background of the Problem

Leaders in the machining industry have used technological innovations to change the way they conduct business (Brunswicker & Vanhaverbeke, 2015; Jimenez et al., 2015; Kang et al., 2016). Those same leaders often find themselves forced to create an environment requiring quick modification of machining processes due to technological modernizations (Brettel, Friederichsen, Keller, & Rosenberg, 2014; Brunswicker & Vanhaverbeke, 2015; Choi, Kim, & Do Noh, 2015; Kang et al., 2016). However, the use of new technologies presents challenges to both employers and employees alike, especially in machining industry SMEs (Brettel et al., 2014; Helu, Morris, Jung, Lyons, & Leong, 2015; Hori, 2011; Nolan & Garavan, 2016). In such a quick-paced

environment, company leaders often find themselves struggling to complete implementation of new technologies. That struggle is often due to ineffective training strategies and programs for business leaders and other employees (Brunswicker & Vanhaverbeke, 2015; Choi et al., 2015).

Business leaders must ensure that technology integration strategies do not impede the implementation of new technologies within the company. Additionally, those same leaders must ensure that the knowledge and skill levels of employees, as well as their own, are sufficient to achieve optimal efficiency (Cummings, Bridgman, & Brown, 2016; Jimenez et al., 2015). Evidence in the literature showed that problems exist not only with the current unskilled workforce, but also with those desiring to enter the workforce – primarily job seekers who are technologically unprepared to do so (Brunswicker & Vanhaverbeke, 2015; Nolan & Garavan, 2016). Therefore, it is incumbent upon organizational leaders to develop technology implementation strategies resulting in achievement of operational objectives (Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2017).

Problem Statement

Company leaders reported that new machining technologies challenge the skills of employees through the restructuring of manufacturing processes requiring higher levels of technology skills than traditional manufacturing jobs (Riaz, 2015). Furthermore, the lack of effective technology strategies caused as much as a 50% distinction between a company's products and those of its competitors (Visnjic, Jovanovic, Neely, & Engwall, 2017) resulting in a lower standing in the industry. The general business problem for this

study is that the workforce lacks training in technology skills required for the organization to compete effectively in the machining industry. The specific business problem is that some machining industry business leaders in SMEs lacked strategies to implement technology training.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies that machining industry business leaders in SMEs used to implement technology training. The targeted population comprised machining industry business leaders at three SMEs in the Southeastern United States who had successfully used technology-training implementation strategies. The selected population was appropriate because researchers have indicated that the lack of support from business leaders regarding technology use posed a threat to businesses desiring to improve their standing in an industry (Brettel et al., 2014; Jimenez et al., 2015; Visnjic et al., 2017). The contribution to social change could occur through a workforce with higher technology skills who are better prepared to participate in the workforce, and thus, potentially provide a better quality of life for themselves and their families.

Nature of the Study

I chose the qualitative method to explore the implementation of technology strategies developed by organizational leaders in the machining industry. Through qualitative research, researchers may better understand how participants interpret their experience and its meaning (Baillie, 2015). Quantitative research methods involve data expressed numerically (Yin, 2018). Mixed methods researchers use qualitative and

quantitative strategies (Baillie, 2015). As this study did not include a quantitative element or the testing of a hypothesis, qualitative research was more appropriate. Additionally, researchers using a qualitative research method are better able to focus on a single phenomenon or experience at deeper levels than quantitative researchers (Baillie, 2015; Yin, 2015).

While I chose a qualitative case study approach because my focus was on exploring implementation of technology-training strategies in machining SME, there were other designs worthy of consideration. Researchers use a phenomenological design in analyzing data based on participant experiences of some identified phenomenon (Yin, 2018). Phenomenological design was not appropriate for this study because I sought to understand and compare implementation of strategies used by participants at various locations. With ethnographic design, the researcher studies a particular group over a designated period (Baillie, 2015). The ethnographic design did not align with my desire to explore technology-training strategies at machining businesses (Yin, 2018). The narrative design researcher provides input in a collaborative format during data collection (Baillie, 2015); however, I chose to explore the topic on an individual level. Researchers conducting case studies use a variety of data sources such as interviews and archival documentation to gain a deeper understanding of a phenomenon (Yin, 2018). Therefore, a case study design seemed most appropriate for this study as I explored strategies business leaders used for technology integration within a natural setting.

Research Question

What strategies do machining industry business leaders in SMEs use to implement technology training?

Interview Questions

For the study, I developed seven interview questions.

1. What technologies are currently in use within your organization?
2. What are the primary steps you use within your strategy implementation for technology training within your organization?
3. What are some of the barriers that you have encountered during implementation of technology-training strategies within your organization?
4. How did you address or overcome identified barriers to technology training?
5. What benefits has your company realized from implementation of strategies for technology training?
6. What experiences can you share regarding implementation of technology-training strategies?
7. Is there any additional information that you wish to provide concerning technology implementation strategies used within your company?

Conceptual Framework

I designed the conceptual framework for this study around reasoned action theory, as demonstrated through the technology acceptance model (TAM). Using reasoned action theory, Davis, Bagozzi, and Warshaw (1992) developed the TAM to assess an individual's acceptance and use of technology. The trio focused on how an employee's

acceptance of technology correlated to how the user views the use of technology in the workplace (Davis et al., 1992). Davis et al. confirmed that beliefs and attitudes about technology influence the behavior of leaders, and thus the development and implementation of strategies and operations of an organization. Yoon (2016) used the TAM to explore and analyze acceptance and use of new technologies. Exploring such elements in the realm of SMEs in the machining industry offered ideas for development and implementation of successful technology-training strategies.

Davis et al. (1992) contended that leaders' use of the TAM might offer an understanding of technology attitudes and help to assess the problem of the lack of a workforce trained in technology. Organizational leaders require such knowledge and skills to compete effectively in the machining industry (Baard et al., 2014; Brettel et al., 2014; Tarhini, Horne, & Liu, 2014). Business leaders must also identify and develop strategies to better address technology training needs to achieve optimal operations (Abdullah, Ward, & Ahmed, 2016). Leaders have proven that such strategies are beneficial in permitting the organization to achieve a competitive advantage in its industry (Abdallah, Ahlan, & Abdullah, 2016; Mohammadi, 2015).

For this study, I explored the implementation of technology-training strategies based on the concepts of the TAM. Those concepts included the constructs of perceived usefulness (PU) and perceived ease of use (PEOU; Davis et al., 1992). Understanding the influence those elements of the TAM has on leaders with the responsibility for training the workforce provided guidance in developing successful training programs, as well as provided best practices for SMEs in the machining industry. Organizational leaders must

evaluate personal attitudes and beliefs regarding technology training to ensure those characteristics do not impede the development and success of strategies designed to offer optimum operations (Jimenez et al., 2015).

Operational Definitions

The main concepts for this study were technology training, development of effective strategies, and change management. Below is a lists of terms and operational definitions supporting those concepts.

Change management: All stakeholders of an organization must alter their mindset and change prior ways of thinking about innovations for change management to occur. Change management can be a complicated undertaking because it centers on changing the attitudes and beliefs of workers for them to accept new technologies (Burnes & Bargal, 2017).

Department: A department is a particular operational area within a business that usually performs a particular operation(s) or process(es) based on specific knowledge and skills (Karanges, Johnston, Beatson, & Lings, 2015).

Innovation: Innovation is a modernization of a company's operations and processes, which can offer improvement or advancement of a company's standing in the marketplace (Torugsa & Arundel, 2016).

Small to medium enterprises (SMEs): SMEs are organizations that are small in nature and usually defined as having fewer than 250 employees. While numerically smaller than their counterparts in large corporations, employees of SMEs supply a

significant amount of the gross domestic product (GDP) of the United States (Molinillo & Japutra, 2017; Riaz, 2015; Stahl & De Luque, 2014).

Skill-biased technological change: Skill-biased technological change is a concept based on the premise that the integration of technology into the workplace requires a different type and higher level of skills from the workforce (Molinillo & Japutra, 2017; Riaz, 2015; Stahl & De Luque, 2014).

Sustainability: Broadly defined, sustainability occurs when company leaders assure each critical element of an organization's operations is assisting in providing the long-term viability of the company (Hornstein, 2015).

Technology integration: Technology integration, combined with a variety of training and instructional methods, occurs when infused into a business' training programs and operations (Koh & Chai, 2016).

Assumptions, Limitations, and Delimitations

Assumptions

In qualitative research, assumptions are invisible, yet without their existence, the research is irrelevant (Baillie, 2015). Additionally, assumptions are straightforward, generally understood by the reader, and stated (Baillie, 2015). By including fundamental assumptions, limitations, and delimitations in a study, the researcher provides more meaningful and legitimate research (Yin, 2018). A consideration of such fundamentals helps further explain specific elements within the research. This study included four essential assumptions. My first assumption was that the sample of participants' was representative of the population. The second assumption was that interview responses in

this study were indicative of those possibly offered by individuals outside the target population. A third assumption was that all individuals responding in an open, honest, and forthright manner. I also assumed that the number of participants in the study was adequate to provide a sufficient amount of data, allowing for a better understanding of current levels of technology training through this case study.

Limitations

Limitations are possible disadvantages or difficulties linked to a study that our outside of the researcher's control (Baillie, 2015). For this study, interview responses were indicative of the mood of the participant at the time of the questioning. A different response may surface at a different period. My personal experience with technology and training programs presented one notable limitation. While such unintended biases from experience, attitude, and beliefs may exist, it was incumbent upon me to ensure those elements did not interfere with the outcomes of the study. To ensure such interference did not occur, I followed the interview protocol closely and guarded against the injection of my opinions, ideas, and beliefs. Avoiding such interference rendered the research more credible (Baillie, 2015).

Delimitations

Delimitations are those characteristics that may limit the scope of the study and determine the restrictions or boundaries of the study (Baillie, 2015). Delimitations, controlled by the researcher, include the many choices associated with a study (Yin, 2015). For example, boundaries may include objectives of the study, the research question, and the chosen population (Baillie, 2015). For this study, the first delimitation

was the selection of the research topic. A second boundary was the geographic selection of a rural area in the Southeastern United States. A third delimitation was that I selected organizational leaders as participants for the study and not lower-level employees.

Significance of the Study

The research results may be of value to businesses in developing technology-training strategies that ensure closer alignment with operational strategies. In the past, organizational leaders have offered many types of technology-training programs at all levels of operations (Jimenez et al., 2015). Through the results of this study, I have provided recommendations for developing appropriate technology-training strategies, that may increase technology knowledge and skill sets of the workforce, particularly in SMEs.

Contribution to Business Practice

In this study, I have contributed to the effective practice of business by providing guidance and knowledge for organizational leaders focused on training employees through the development and implementation of technology strategies and training programs. Organizational leaders often demonstrate a lack of skills through a lack of talent and knowledge (Molinillo & Japutra, 2017). It is common practice for leaders to provide the vision and overall mission and strategies of an organization. Nonetheless, it is imperative those same leaders provide the necessary resources and opportunities for skills-based training for employees (Hori, 2011; Molinillo & Japutra, 2017; Stahl & De Luque, 2014).

Leadership and management styles in manufacturing organizations have changed over time due to evolving elements and factors (Bloom, Garciano, Sadun, & Van Reenen,

2014; Donate & de Pablo, 2015; Jimenez et al., 2015; Kang et al., 2016). Leaders have often varied their styles based on operational strategies and efficiencies due to innovations (Dong, Bartol, Zhang, & Li, 2017; Hamidianpour, Esmaeilpour, & Zarci, 2016). One of the more recent advances in manufacturing organizations has centered on new technologies and their integration into operational processes (Bloom et al., 2014; Kalpakjian & Schmid, 2014; Molinillo & Japutra, 2017; Stahl & De Luque, 2014). While many larger organizations have embraced such innovations and supplied the necessary resources for implementation into the actual workflow, many leaders in SMEs have found themselves struggling to survive (Bloom et al., 2014; Hori, 2011). The survival of SMEs has also been directly contingent on the skill levels of the workforce (Hori, 2011). Through the results of this study, I have offered contributions to SME leaders focused on increasing the technology knowledge and skills sets of employees through training. Developing effective strategies aimed at technology training for employees may help to increase profitability, increase education levels, and increase retention rates.

Implications for Social Change

The research results may contribute to positive social change through increased levels of knowledge in the workplace and increased wages for the workforce. There is a 10% expected job growth for machinists through the year 2022, with pay for those jobs rising to nearly $35 per hour (U.S. Department of Labor [DOL], 2018). However, as Visnjic et al. (2017) demonstrated, new machining technologies have changed the workplace and now challenge the skills and abilities of all machining employees. Those changes are evident through the restructuring of manufacturing processes requiring

higher levels of technology expertise and knowledge than those of traditional manufacturing job duties (Baard et al., 2014; Butcher & Jameson, 2016; Kang et al., 2016; Riaz, 2015). The implications for social change offered through this study may be apparent through a workforce with higher technology skills that is better prepared to participate in the workplace and thus is better positioned to improve quality of life for themselves and their families.

A Review of the Professional and Academic Literature

A literature review enhances research in a variety of ways. Baillie (2015) showed that such a review helps determine whether the topic is worthy of further study. A sound literature review shows whether the topic would provide for ample participants and whether the results and findings would be of interest to others in the same field (Baillie, 2015). The literature review for this study involved my exploration of sources relating to implementation of training strategies that SME machining business leaders used to implement technology training.

Through the literature review process, I explored peer-reviewed and scholarly references supporting the information in this study. The research databases I utilized for the study were EBSCOhost, ProQuest, Business Premier, ABI/INFORM Global, and Google Scholar. I also reviewed numerous books, journals, dissertations, government reports, and working papers. Key terms used for database searches included: *organizational change, manufacturing processes, change management, department, innovation, small to medium enterprises, skill-biased technological change,* and *technology integration.* Following basic guidelines of a literature review matrix and

organizing the themes of the sources offered a much more organized approach to the study. References include 118 sources with 83 of those sources having publication dates of 2015 or later.

Table 1

Source Identification and Accountability

			Published 2015 or later	
Category	Total	Peer-reviewed	Total	Peer-reviewed
Books	7	0	7	0
Journal articles	106	106	71	71
Dissertations	3	0	3	0
Government report	1	0	1	0
Working paper	1	0	1	0
Total	118	106	83	71

I explored three components of technology that may affect organizational decisions and strategies. Those components were (a) technology integration; (b) barriers that influence technology integration; and (c) organizational learning, training, and culture. For this study, I utilized the TAM as the conceptual framework to explore how individual perceptions and beliefs affect technology training in the workplace.

A literature review centered on those three themes offered me a better understanding of new technologies used by the current workforce and why companies often offer inadequate technology training. Researchers in prior studies, which addressed the problems surrounding technology training, have focused on a variety of angles. Those angles included the age of those learning the technology, preparedness of those offering training, the inefficiencies of training, and the perceptions, beliefs, and attitudes of leaders (Galloway & Lesaux, 2014; Gibson et al., 2014; Jimenez et al., 2015; Ticona,

2015). Other topics related to technology training have included organizational culture, change management initiatives, and leadership styles and behaviors required for successful training and strategy development (Burnes & Bargal, 2017; Cummings et al., 2016; Donate & de Pablo, 2015; Hori, 2011; Lin, Ku, & Huang, 2014; Molinillo & Japutra, 2017).

Researchers have also focused on the many benefits of technology training that outweigh the challenges of implementing change in business operations and processes (Cummings et al., 2016; Hori, 2011; Molinillo & Japutra, 2017; Stahl & De Luque, 2014). One of the primary benefits of technology training concerns preparing employees to enter the 21st-century workforce. A second benefit involves how the uses of new technologies help ensure the efficiency of operations for both the individual department and the business as a whole (Hori, 2011; Jimenez et al., 2015; Molinillo & Japutra, 2017). Braun, Peus, and Knipfer (2015) and Donate and de Pablo (2015) showed how support from leadership in developing a culture where technology is engaged was crucial to any technology integration effort. Company leaders must have the capability to achieve successful change initiatives leading to achievement of strategic goals (Braun et al., 2015; Cummings et al., 2016; Donate & de Pablo, 2015; Hamidianpour et al., 2016). Business leaders must also ensure development and implementation of effective training strategies (Donate & de Pablo, 2015).

Technology Integration

To gain a better understanding how elements of the TAM influence technology integration and training, I explored the topic and how it affected development and

implementation of technology strategies in the machining industry. The constant development of new technologies is the single most transformative element in current global economies (Christiansen, 2015; Erasmus, Rothmann, & Van Eeden, 2015; Molinillo & Japutra, 2017; Stahl & De Luque, 2014). However, organizational leaders have discovered that such innovations have changed the manner in which business is conducted for large corporations as well as SMEs (Christiansen, 2015; Molinillo & Japutra, 2017; Stahl & De Luque, 2014). Therefore, it is incumbent upon organizational leaders to learn effective management of such changes from new inventions and trends (Erasmus et al., 2015; Hill & Birkinshaw, 2014; Molinillo & Japutra, 2017). Researchers agree that efficient technology integration into company operations and processes benefits an organization's overall effectiveness and its bottom line (Braun et al., 2015; Hamidianpour et al., 2016; Stahl & De Luque, 2014).

The skill sets and knowledge required of employees in the current workforce are much different from those required at any other time in history (Molinillo & Japutra, 2017). Both cognitive skills and technology skills are necessary for assisting employees with the incorporation of new technologies into job processes and company operations (Hori, 2011; Molinillo & Japutra, 2017). In essence, technological innovation caused a skill bias when it comes to technology acceptance and integration. In the literature review, I found evidence that technology integration requires a higher level of both types of skills for employees and organizations as a whole to achieve efficiency and a competitive advantage (Hori, 2011; Molinillo & Japutra, 2017; Stahl & De Luque, 2014).

The role of SMEs in economic growth is often misinterpreted in the global marketplace (Christiansen, 2015; Molinillo & Japutra, 2017; Stahl & De Luque, 2014). SMEs are a critical component of the American economy, especially in the GDP (Molinillo & Japutra, 2017; Stahl & De Luque, 2014). Researchers studying large corporations and the introduction of new technologies into the global marketplace have provided evidence of the correlation between new technologies and the GDP (Molinillo & Japutra, 2017; Stahl & De Luque, 2014). However, the literature was quite lacking when it came to SMEs and technology strategy development and training. With technology, all types and sizes of organizations must exhibit an exemplary workforce equipped with both cognitive and technical skills (Hori, 2011; Jimenez et al., 2015).

There are many differences between large corporations and SMEs. Large organizations tend to be decentralized and have operations and processes that are multifaceted, abundant monetary assets, and business leaders with a higher level of specialized proficiencies (Hill & Birkinshaw, 2014; Ticona, 2015). Consequently, it often appears at first glance that SMEs are at a tremendous disadvantage when it comes to workforce skills, capabilities, and profits (Molinillo & Japutra, 2017; Stahl & De Luque, 2014; Ticona, 2015). Still, leaders in SMEs face the same daily challenges as large companies when it comes to developing and implementing technology-training strategies, making the impact of such integration seemingly impossible (Hill & Birkinshaw, 2014; Molinillo & Japutra, 2017). With SMEs, two primary factors are influential: an older workforce with longevity, and a younger workforce with newer skills and knowledge (Hori, 2011; Molinillo & Japutra, 2017; Ticona, 2015). Despite this fact, as Molinillo and

Japutra (2017) illustrated, there is the potential for profit and competitive advantage in SMEs with both younger and older workers alike. The key to such success lies in development and implementation of effective technology strategies (Donate & de Pablo, 2015; Molinillo & Japutra, 2017; Tourish, 2014).

One perception regarding a higher skilled workforce is that employees who are more knowledgeable often demand a higher salary. Therefore, Molinillo and Japutra (2017) suggested SMEs avoid hiring older workers and younger, higher skilled workers if emerging technological advances do not affect the company operations. However, most businesses use some type of technology (Ticona, 2015). From the simple use of e-mail or word processing software to specialized machinery and software, leaders at both large corporations and SMEs are noting the impact of new technologies on both their workforce and their bottom line (Hori, 2011; Molinillo & Japutra, 2017; Ticona, 2015).

While the presence and use of technology are becoming more widespread, there is evidence indicating that full technology integration into America's workplace has not occurred (Kawakami, Barczak, & Durmusoglu, 2014; Quintana & Zambrano, 2014; Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2017). There are also research findings indicating that some industries have less technology in use currently than 2 decades ago (Glenn, 2016). Even with many new technologies in place, technology training and acceptance has not occurred in many companies due, in part, to a lack of comprehensive implementation strategies (Parker, Stylinski, Bonney, Schillaci, & McAuliffe, 2015; Quintana & Zambrano, 2014). The disturbing element of the Quintana and Zambrano (2014) study was that a lack of use in less than one-half of the companies

in the United States demonstrated evidence of inadequate technology strategies. The fact that technology was nonexistent in so many organizations was quite disturbing, as the organizational leaders participating in the Quintana and Zambrano study considered the employee participants to be the most technology-proficient employees within their organizations (Quintana & Zambrano, 2014).

Even with technologies in place, employee participants in studies have offered a variety of reasons as to why they are not used (Parker et al., 2015; Paver, Walker, & Hung, 2014; Quintana & Zambrano, 2014; Tondeur et al., 2017). Quintana and Zambrano (2014) focused on why teachers do not use technology as an instructional tool in the classroom or attempt to integrate technology into the respective curriculum areas. Thirty public school teachers from elementary, middle, and high schools participated in the qualitative study developed to determine the extent each teacher used technology in the classroom (Quintana & Zambrano, 2014). The pair offered suggestions for teachers, administrators, and teacher educators alike for successful technology integration and acceptance (Quintana & Zambrano, 2014). However, the primary suggestion centered on a lack of implementation strategies.

Funding is a critical part of technology integration in both public and private sector organizations (Tondeur et al., 2017). While many organizations have been limited in funding to make technology purchases, most in the Tondeur et al. (2017) study did have in place some of the fundamental technologies like e-mail. Still, many barriers such as current policies, lack of efficient strategies, personal employee beliefs, and other conditions derived from nonsupport from organizational leaders have prohibited full

integration of technology (Allen & Penuel, 2015; Baker et al., 2015; Tondeur et al., 2017).

For some companies and organizations, there was ample funding for technology resources (Parker et al., 2015). In other organizations, funding limitations prevented leaders from fully integrating technology into the company's operations (Parker et al., 2015). One limitation Parker et al. (2015) illustrated was the mismatch between funding and integration within a particular region. The location used in the Parker et al. study, known for incredible funding of technology, caused the researchers to note the non-generalizability of the results, as other regions in the same state were not likely to have the same technologies. In addition, self-reported responses from the participants provided no opportunity for verification of the results (Parker et al., 2015).

There is often confusion over the quantity and the quality of technology used. Parker et al. (2015) contended the quality of technology usage was much more important than the amount. The quality of employees' technology use correlated to real success (Parker et al., 2015). Parker et al. studied quantity and quality of the technology integration efforts using five specific technology uses. Nonetheless, Parker et al. found that there was no revelation of the amount of time invested in technology training, demonstrating a noteworthy relationship between the amount of technology use and outcomes. However, the researchers discovered that perhaps the greatest hindrance to successful technology integration involved on the lack of effective implementation strategies (Parker et al., 2015).

Positive results are the primary focus of the need for technology integration (Parker et al., 2015). However, various researchers explored and provided evidence of other reasons why technology was desirable (Morreale, Staley, Stavrositu, & Krakowiak, 2015; Parker et al., 2015). Morreale et al. (2015) provided a comparison of technology to science founded in the fact that science is the basis for most inventions. Morreale et al. noted technologies were now performing the same or similar role. The authors of the study provided an example of comments from one community known for its large oil and gas industries (Morreale et al., 2015). Many people in the particular area did not see technology as an integral part of their child's life as those students were destined to graduate from high school and obtain employment in the area at one of the oil or gas employers (Morreale et al., 2015). Nonetheless, researchers demonstrated that perhaps the oil and gas industry is dependent on technology more so than most other industries (Morreale et al., 2015). Morreale et al. concluded the inclusion of technology in almost every current industry provides evidence technology is seemingly taking the place of science. In reality, very few jobs currently do not include some technology (Morreale et al., 2015; Parker et al., 2015). It is critical for company leaders to ensure full acceptance and integration into training processes and operations to maximize efficiency (Hori, 2011; Jimenez et al., 2015; Molinillo & Japutra, 2017). Such success is a derivative of comprehensive implementation strategies (Jimenez et al., 2015).

Technology Acceptance Model

Many organizational leaders understand the importance of technology integration and training and their influence on operational processes (Yoon, 2016). However, those

same leaders fail to understand the importance of learning why employees accept or reject a technology and its use (Erasmus et al., 2015; Yoon, 2016). Abdullah et al. (2016) and Yoon (2016) found that the use of new technologies improves both organizational and personal efficiency. The underlying reason for the failure of leaders to understand this importance is that traditionally, researchers used the TAM to explore computer use behavior (Yoon, 2016). However, researchers also use the TAM in a variety of fields to explore acceptance of various types of technology applications and their effect on providing better service in many industries (Yoon, 2016).

Researchers used the TAM for decades and touted its use as one of the best-known theories for evaluating technology acceptance (Yoon, 2016). Organizational leaders also used the TAM to assist in determining the likelihood of technology acceptance in the workplace (Yoon, 2016). The central constructs of the TAM are subject norm (SN), perceived usefulness (PU), and perceived ease of use (PEoU; Yoon, 2016). The primary usage elements relating to technology integration are behavioral intention to use (IU), attitude toward use (ATU), and actual use/usage (AU; Yoon, 2016). Researchers of various studies offered descriptions of how perceived usefulness (PU) and the perceived ease-of-use (PEoU) help to determine if an individual intends to use (IU) technology (Klassen & Tze, 2014; Yoon, 2016).

Traditionally, the TAM served to assess leaders in the preparedness of individuals on technology integration based on perceptions and beliefs (Abdullah et al., 2016). Some researchers contended that while the TAM was useful at the time, its usefulness might have become obsolete for some organizations as there was no inclusion of organizational

leader or employee fears in many studies (Abdullah et al., 2016). The central dilemmas associated with the TAM centered on the explosion of many new technologies and problems related to how to integrate them into the workplace and gain acceptance by employees (Abdullah et al., 2016). Many researchers focused on perceptions, concerning success, value, and cost as related to technology acceptance and integration on the part of the employee, not organizational leaders (Hauge, 2014). Hauge (2014) explored attitudes, values, and perceptions of individuals concerning the current use of and intent to use technology. In Hauge's qualitative study, he found that values and technology experience of organizational leaders directly affected the type and amount of technology accepted and integrated into an organization by employees (Hauge, 2014). Thus, Hauge contended that the perceptions, beliefs, and attitudes of company leaders help determine the quantity and quality of technology integration in an organization (Abdullah et al., 2016; Erasmus et al., 2015).

Klassen and Tze (2014) used the TAM as the foundation for research concerning the acceptance level of technology in the workplace. The pair discovered how positive feedback and continued evaluation of use of technology provided the most promising results concerning technology acceptance (Klassen & Tze, 2014). Additionally, Klassen and Tze contended most makers of technologies declare them as user-friendly; however, this was not the case in most circumstances. Seldom was consideration for the audience using the hardware and software included in such purchase decisions (Abdullah et al., 2016; Klassen & Tze, 2014). The lack of inclusion of psychological factors may be the underlying reason why integration and acceptance rates have not increased significantly

(Abdullah et al., 2016). Hence, psychological elements are critical to the success of technology integration. For the Klassen and Tze study, psychological elements served as those involving cognitive and behavioral elements, which may affect acceptance of technology on the part of the user.

Researchers noted the TAM as the most significant indicator of an individual's acceptance behavior in technology integration and training (Visnjic et al., 2017). The reasons were many; however, the two primary factors affecting the TAM's success were the two basic constructs of PU and PEoU (Yoon, 2016). PU is the perceived use or how an employee views the new technology will enhance their job, and PEoU is the perceived-ease-of use or how much time and effort will be required to learn the new technology (Yoon, 2016). However, past researchers focused primarily on employees, which were often self-reported. Many past researchers who studied employee beliefs, attitudes, and perceptions used self-assessment instruments (Abdullah et al., 2016; Scherer, Siddiq, & Teo, 2015).

The Scherer et al. (2015) study was possible through a partially funded federal grant program and included statistics from the National Center for Educational Statistics (NCES), which served as the foundation for the study. Researchers conducting an analysis of federal and state documents found millions of dollars issued to public organizations for technology purchases (Scherer et al., 2015). Those same researchers of NCES documents found that not even half of the employees in the region covered in the study had used the purchased technologies (Scherer et al., 2015). Based on those results, the group contended that an immense lack of technology existed compared to the reports

of use and non-use from the participants (Scherer et al., 2015). Those findings, based on employee participant responses, included no assessment of organizational leaders' PU or PEoU (Scherer et al., 2015). The findings also did not include an assessment of technology-training strategies.

As beliefs and practices affect every aspect of an individual's personal life, it is natural to assume those beliefs and practices affect workplace behavior (Tondeur et al., 2017). Tondeur et al. (2017) suggested using the TAM in future research on organizational leaders' beliefs and practices concerning technology integration and acceptance. The pair contended such research might include a focus on factors regarding life experiences, societal standards, and cultural customs to determine the effect each may have on technology integration and acceptance.

Human beings often experience changes in attitudes and beliefs over time (Tondeur et al., 2017). Therefore, it is natural to assume changes in attitudes and beliefs about technology may occur over time as well (Tondeur et al., 2017). For example, during the early stages of integration, PU directly correlated to IU (Yoon, 2016). However, once new technologies are integrated, PU and PEOU rise in importance. Different perceptions and beliefs may occur at other stages of integration (Yoon, 2016). One suggestion for future research regarding technology integration was for measurement of those behavioral elements over time (Tondeur et al., 2017).

Integrating technology into organizational operations is a very delicate and individualized act on the part of the leader as success often relies on human behavior (Klassen & Tze, 2014; Lin et al., 2014). Prior researchers have demonstrated successful

technology implementation efforts are somewhat pre-determined by leaders' personalities, beliefs, attitude, and behaviors (Benton-Borghi, 2016; Chai, Tan, Deng, & Koh, 2017; Lin et al., 2014). For example, researchers of one study indicated employees were more likely to experience success with technology if it was similar to an activity they had experienced (Benton-Borghi, 2016). According to Klassen and Tze (2014), developers of technology should gather input from leaders proficient in technology. Those same leaders also have individual parameters and boundaries of learning styles and should be included in technology planning, as well as strategy development (Benton-Borghi, 2016; Chai et al., 2017). Researchers contended that technology designed in a manner that includes various learning styles and the constructs associated with the TAM could increase the levels of technology integration and acceptance (Benton-Borghi, 2016; Chai et al., 2017).

Development of ineffective technology strategies by organizational leaders is the primary element affecting technology integration, training, and acceptance in the workplace (Benton-Borghi, 2016; Chai et al., 2017). While many researchers provided evidence to explain the lack of strategies and their effect on technology integration and training, there was a lack of research on how the inadequacies reflect upon a company leader's actual use of technology (Quintana & Zambrano, 2014; Teo, 2014). Teo (2014) contended many behavioral elements determine the act of integration. Teo demonstrated the reported perceived usefulness, ease of use, facilitating conditions, lack of implementation strategies, and attitude toward use were the primary factors interfering

with technology integration and training. Teo did not consider subjective norm as a primary factor in the study (Teo, 2014).

Yoon (2016) contended that while the TAM has offered a better understanding of why employees may or may not choose to accept or utilize new technologies, there were problems associated with the theory. Yoon found that one of the primary faults of TAM is that there are no performance guidelines and measures offered for use in the real world. Yoon further contended that the lack of such guidelines served as a negative factor by those organizational leaders who desire a more predictive indicator of employee behavior regarding technology acceptance and influence on training. Another problem Yoon identified in using the TAM centered on the fact that behavior of others often influences an individual's technology acceptance level. Yoon discovered more supporting evidence of the problems with behaviors such as trust and expectations of technology use. However, both of those behaviors are intrinsic and may have been inaccurate in some studies (Yoon, 2016). Researchers presented no identified studies exploring the element of gender in the TAM, causing more concern for the model's completeness and inclusion (Yoon, 2016).

While some company leaders willingly attempt technology integration into the respective departments, many do not (Rienties, Giesbers, Lygo-Baker, Ma, & Rees, 2016). Rienties et al. (2016) discovered that some leaders were willing to consider the integration of technology; yet the lack of effective implementation strategies prevented successful integration across all fields and industries. Rienties et al. concluded that

barriers including the lack of education, the lack of preparation, and the lack of clearly articulated strategies prevented full technology integration.

Tondeur et al. (2017) investigated the relationship of knowledge, confidence, beliefs, and culture as an influence on technology integration. For successful integration to occur, teachers must have a change in mindset (Paver et al., 2014; Spanos & Sofos, 2015; Tondeur et al., 2017). As Tondeur et al. discovered, teachers were more likely to integrate technology after learning and witnessing the many benefits to students. Consequently, participants deemed professional development training alone as inadequate in creating a desire in teachers to change technology practices in the classroom (Spanos & Sofos, 2015; Tondeur et al., 2017). The same applies to those company leaders and employees in business and industry (Tondeur et al., 2017). If there is no incentive to help create a desire to integrate technologies, it may not occur (Spanos & Sofos, 2015).

Perceptions, attitudes, and critical thinking on the part of organizational leaders play the most vital role in technology strategy development (Allen & Penuel, 2015; Kim-Soon, Ahmad, Sirisa, Fang, & Tat, 2016). Allen and Penuel (2015) demonstrated how ultimately the success of any implementation initiative depends entirely on the organizational leaders, as they are the individuals who determine what processes and operations the company may follow. One of the problems with integration is some company leaders may have no input into the development of technology policies and training (Allen & Penuel, 2015; Tondeur et al., 2017; Kawakami et al., 2014). Still, other leaders have no effective training strategies (Allen & Penuel, 2015). It is interesting to

note organizational leaders are the ones providing the attitude, knowledge, and skills in effective implementation (Putman, 2014). Should leaders decide not to focus on or use technology, no incorporation of technology into operations occurs (Allen & Penuel, 2015; Tondeur et al., 2017).

The behaviors associated with organizational leaders offering support with technology integration do not require an exhaustive amount of development of strategies and initiatives as the literature includes many ideas and suggestions (Glenn, 2016); Hauge, 2014; Lin et al., 2014). For example, Bennett (2014) offered a comprehensive guide for company leaders in resolving issues with technology integration and acceptance. Bennett provided suggestions on various topics from professional development training opportunities to technical support. However, Bennett concluded the primary barrier to technology integration centered on the lack of a clear technology plan and effective training strategies in those organizations participating in the study. In the absence of a strategic technology plan, some company leaders often chose whether to use technology or not (Bennett, 2014; Hooley, Hutchinson, & Neary, 2015; Lin et al., 2014).

Lee and Moon (2015) contended unused technology was ineffective in helping to improve job performance and production. In fact, such non-use of technology and computers, in general, was a tremendous problem common across industries throughout the United States (Lee & Moon, 2015). That acknowledgment made nearly 25 years ago remains true even though great strides have occurred in technology (Adams, Jeanrenaud, Bessant, Denyer, & Overy, 2016; Jimenez et al., 2015; Lee & Moon, 2015). Much resistance regarding the use and acceptance of technology in the workplace still exists

(Lee & Moon, 2015). Researchers have discovered evidence of such resistance through the lack of technology integration and acceptance permeating entire educational systems, businesses, and organizations throughout the country (Adams et al., 2016; Hori, 2011; Jimenez et al., 2015; Mintz & Tal, 2014). To better understand why such resistance exists, Lee and Moon researched computer acceptance and, in particular, the variables and characteristics determining acceptance. The researchers focused on predicting workers' acceptance of technology based on intentions and abilities as described in the TAM (Lee & Moon, 2015). Lee and Moon found that perceptions, beliefs, and attitudes of leaders revealed much about an individual's hesitancy to use and accept technology (Lee & Moon, 2015).

Barriers

While the TAM is useful in determining perceived use (PU) and perceived ease of use (PEoU) in technology acceptance, those are not the only constructs influencing technology strategy development (Yoon, 2016). Numerous factors affect an employee's intention to use (IU) technology in the workplace (Visnjic et al., 2017). Researchers have provided an abundance of information in the literature regarding the many barriers associated with technology integration and acceptance. Some researchers focused on groups of obstacles, often categorizing them in a variety of ways (Quintana & Zambrano, 2014). Still, other researchers included a focus on one particular obstacle (Teo, 2014). As business leaders are the primary conductor for change, most of the researchers included a focus on barriers from a leader's perspective (Teo, 2014).

The question no longer centers on the inclusion of technology, but how (Bennett, 2014). For organizational leaders to operate companies at optimal efficiency, technology strategy development must become a significant component of the organization's strategic processes and operations (Bennett, 2014; Kawakami et al., 2014; Tondeur et al., 2017). Bennett (2014) contended there are three primary aspects of technology integration and acceptance. The first facet, as noted by Bennett and other researchers, included having assistance from qualified individuals to provide hands-on instruction and training (Scherer et al., 2015; Tondeur et al., 2017). Such technology integration efforts must also parallel established company objectives (Bennett, 2014). Lastly, leaders must demonstrate excitement, encouragement, and passion regarding technology to motivate and engage employees in learning (Bennett, 2014; Scherer et al., 2015; Tondeur et al., 2017). Organizational leaders must ensure technology planning is comprehensive and broad-based enough to include employees at all levels of an organization to maintain quality performance (Bennett, 2014; Scherer et al., 2015; Tondeur et al., 2017).

Rienties et al. (2016) focused on a list of particular barriers to full technology integration and demonstrated one primary limitation. The researchers also found indirect obstacles to technology integration including poor soft skills like time management, and often, employees who were poorly matched with their respective job duties (Rienties et al., 2016). Rienties et al. concluded that professional development activities created with a focus on increasing technology integration might help to remove some of the reported barriers. The most beneficial actions on the part of organizational leaders might be to provide adequate time and technical support for employees (Rienties et al., 2016).

However, no single activity may improve the rate of technology integration and acceptance (Rienties et al., 2016). It may take a concentrated effort on the part of organizational leaders in providing each of those components that build upon each other to create efficient technology strategies and implementation (Rienties et al., 2016). That effort must include appropriate time allocated to training activities, as well as ensuring employees appropriately match their jobs.

Equipment and resources. Participants in prior studies regarding technology integration and training reported on the lack of adequate equipment and resources (Glenn, 2016; Quintana & Zambrano, 2014; Wu, Chen, & Hou, 2015). Quintana and Zambrano (2014) found inappropriate software and hardware was the primary reason individuals accepting of technology reported for the lack of technology integration. Beyond inappropriate software and hardware, some study participants detailed negative issues associated with unreliable technology (Spanos & Sofos, 2015). In many cases, workers reported having access to technology; yet it was not always in working order, and employees did not want to take the chance of it not operating during work time (Spanos & Sofos, 2015). Participants also reported that an inadequate amount of resources allocated to technology integration and nonworking technology as reasons why employees often possessed a lack of knowledge in technology use and operation (Spanos & Sofos, 2015).

In one case study, Hauge (2014) focused on the lack of new technologies for improving or augmenting job training. Hauge found many institutions have the technology equipment and resources in place within the organization; yet, often those

technologies sat idle. Hauge further asserted future researchers should focus on the funding required to purchase new technologies, especially in the case of educational organizations. Other scholars offered little evidence of how organizations were using all of the technologies available to them in job training (Abdullah et al., 2016; Hauge, 2014).

There are many differences among technology users and the level of technology use and acceptance based on demographics, populations, and technologies (Klassen & Tze, 2014). Many external variables also affect technology integration. Klassen and Tze (2014) future researchers include simulations and modeling to ensure user-friendliness of technologies. In fact, Klassen and Tze contended external variables might have a more significant impact on users of technology than psychological elements. Still, Klassen and Tze concluded that the most important implication of the study was future developments from technology researchers should include a comprehensive exploration of what users desire to increase acceptance levels (Klassen & Tze, 2014). Organizational leaders may be able to decrease downtime associated with technology due to non-use if leaders ensure technologies are user-friendly (Klassen & Tze, 2014).

Other barriers listed by participants in technology integration and training research included insufficient physical and fiscal resources (Glenn, 2016; Klassen & Tze, 2014). Two disturbing barriers offered by participant responses included poor leadership and lack of visionary leadership regarding technology strategy development (Donate & de Pablo, 2015; Glenn, 2016). The lack of visionary leadership is considered quite unsettling in organizations often participating in a global marketplace (Christiansen, 2015; Klassen & Tze, 2014). Such responses listed by participants in prior studies might

imply that business leaders should focus on any possible discrepancies in implementation of technology-training strategies (Gibson et al., 2014; Hori, 2011).

Time constraints. Time is the most critical barrier affecting technology integration training (Abdallah et al., 2016). It takes time to learn new technologies, time for implementation, and time for integration into current planning processes, training programs, and operations (Abdallah et al., 2016). The reason for a time requirement is many company leaders have no time for technology training within their respective departmental areas (Abdallah et al., 2016). Abdallah et al. (2016) concluded that the lack of training might serve as the reason individuals are not confident in the use of technology. In the case of technology training, much of the training is of a hands-on nature and workloads and leave policies created by company leaders do not provide additional time for learning technologies and developing ways in which to incorporate them into departmental processes and operations (Abdallah et al., 2016). Such discrepancies in implementation of technology strategies may prove to be detrimental to a company's standing in its industry (Abdallah et al., 2016).

In many studies, the lack of time repeatedly surfaced as the primary problem with technology integration (Quintana & Zambrano, 2014; Wu et al., 2015). The reality discovered through Glenn's (2016) research was that very few participants used a limited amount of technology, and some did not use it at all. According to the participants in the study, one of the most common reasons for the lack of technology integration was the time limitation (Glenn, 2016; Kawakami et al., 2014; Tondeur et al., 2017). In addition, workers often turned away from technology integration due to a lack of confidence in

whether specific technologies met requirements for operational content (Klassen & Tze, 2014).

Researchers provided much evidence to support the fact that the longer amount of time participants use technology, the more positive outcomes derived. Organizational leaders may use a variety of mechanisms to measure such success (Parker et al., 2015). Parker et al. (2015) provided sufficient evidence supporting high-quality technology use as affecting organizational success in a positive manner. The group offered various suggestions for future research – all centered on the quality of and identification of specific types of technology use. Many participants in the study offered ideas focused on assessments used for evaluation and successes (Jimenez et al., 2015; Parker et al., 2015). Frequently, researchers presented limitations of a study that included a listing of inadequacies with self-assessment instruments (Parker et al., 2015; Quintana & Zambrano, 2014). Quintana and Zambrano (2014) contended the ideas offered by the participants on self-assessment instruments were well worth consideration by all organizations. The evidence of the lack of technology integration should serve as a stern warning for both business and industry leaders alike (Quintana & Zambrano, 2014).

Participants in many studies reported reasons for the lack of technology training revolved around time constraints, physical resources, and lack of encouragement from organizational leaders (Guo, Xiao, Van Toorn, Lai, & Seo, 2016; Hooley et al., 2015; Howard, Ma, & Yang, 2016). However, Guo et al. (2016) were interested in what the group termed as the real reasons why technology was highly underused. There is a developmental element in participant understanding, acceptance, and use of technology

(Guo et al., 2016). Professional development trainers help with several aspects of the dilemma. However, trainers must present customized solutions with each organization and often with each company leader (Guo et al., 2016; Hooley et al., 2015). It then becomes incumbent upon business leaders to ensure allowances of time and physical resources, as well as encouragement, to ensure successful implementation of technology-training strategies.

Employee fears. While there are a variety of established barriers to technology integration, few researchers have addressed the presence of fear in employees. Howard et al. (2016) discovered there are differences in opinion among some organizational leaders and other employees when it comes to technology integration and acceptance. Howard et al. framed research around three primary questions regarding participant perceptions and the concept of technology in use within an organization. The researchers concluded that there were divergent opinions among participants on the quantity and quality of technology integrated (Bennett, 2014; Howard et al., 2016; Spanos & Sofos, 2015; Tondeur et al., 2017). Howard et al. discovered that the fear of replacement by technologies served as a repeated response from participants. There were additional obstacles reported by the participants of the Bennett (2014) study. Those participant responses centered on a limited vision of leadership and adequate time and training opportunities as primary barriers (Bennett, 2014). While many of the researchers focused on education and the lack of technology integration, Glenn (2016) explored the barriers associated with computer technology integration and training in other industries, as well.

Employee fears are a primary factor in establishing an organizational culture and affect technology-training initiatives at various levels (Whitehead, 2015). Future researchers may help to determine if current economic times or the passage of time influence employee perceptions and fears (Whitehead, 2015). Whitehead (2015) concluded future researchers might also focus comparable studies on demographic elements and perceptions of leadership. Whitehead suggested there might be differences in education, income, and longevity levels of employees. Concerning leadership, Whitehead also recommended research focused on how business leaders implement technology-training strategies, which include people across all spectrums of a company's operations. Whitehead contended by including education, income, and longevity considerations into strategy creation, organizational leaders assure a more comprehensive approach to creation, development, and revisions of obsolete strategic planning objectives and goals. Such actions by organizational leaders would positively affect the company's profit margins (Whitehead, 2015). Whitehead further asserted the development of more encompassing technology strategies inclusive of all affected employees provides for the removal of employee fears.

The idea that technology could replace workers was a recurring theme from participants throughout the Howard et al. (2016) study. While individuals in the study appeared very responsive to technology use and considered it a useful learning tool, some did not (Howard et al., 2016). Some employees often viewed more technology integration as an increase in already overburdened workloads (Howard et al., 2016). For successful technology integration in American organizations to occur, organizational leaders must

be comfortable in exploring and executing new methodologies for training (Jimenez et al., 2015). Supportive and encouraging leaders also help alleviate fears of subordinates (Donate & de Pablo, 2015; Jimenez et al., 2015).

While there were a variety of definitions and categorizations of barriers presented by researchers through the current literature associated with the lack of technology integration, Baker et al. (2015) contended any issue that prevents an organizational leader's participation in technology strategy development is an obstacle. The authors considered attitudes and personality traits in addition to organizational support and resources as barriers. Individuals at a particular technology-training academy served as participants for the Baker et al. study. Respondents reported that while the technology training appeared personally beneficial, there was room for improvement in professional guidance. Participants also noted a lack of objectives in training. With employee fears listed as the primary factor hampering technology training efforts, business leaders must offer reassurance and encouragement to help alleviate employee fears (Donate & de Pablo, 2015).

Organizational Learning, Training, and Culture

Learning. The highest level of threat to technology integration occurs when company leaders ignore that a problem exists (Holmberg, 2014; Quintana & Zambrano, 2014; Tondeur et al., 2017). Holmberg (2014) placed full responsibility on organizational leaders to ensure effective change and learning occurs in technology integration and acceptance. Organizational leaders which have successfully integrated technology concurred it takes time for change to take place (Glenn, 2016; Holmberg, 2014;

Kawakami et al., 2014; Konings & Vanormelingen, 2015; Tondeur et al., 2017). Holmberg also found employees might need different types of training and support at each level.

Technology integration and acceptance requires the full support of organizational leaders (Glenn, 2016; Hauge, 2014; Konings & Vanormelingen, 2015). Support comes in many forms from learning about new technologies and ensuring technologies are available to provide professional development training to guaranteeing a supportive culture encouraging and promoting such integration and acceptance (Glenn, 2016; Hauge, 2014; Hooley et al., 2015; Scherer et al., 2015). It is the responsibility of organizational leaders to ensure technology integration, learning, and acceptance occurs at each level within the organization (Glenn, 2016; Hooley et al., 2015; Kawakami et al., 2014). It is also incumbent upon organizational leaders to ensure the technology strategies and training programs are efficient (Glenn, 2016; Konings & Vanormelingen, 2015).

The debate is not about whether or not to adopt technology, but rather the focus should be on how to assist employees in successfully learning and using technology to develop a first-class workforce (Holmberg, 2014). Holmberg (2014) developed an order-approach for categorizing barriers to technology integration and included first- and second-order barriers. First-order barriers included equipment, software, hardware, et cetera. Second-order barriers included behaviors, attitudes, perceptions, fears, et cetera. (Holmberg, 2014). Holmberg also explored integration efforts based on resolving obstacles at each level and based on the stages used by the participants with integration. Kawakami et al. (2014) supported the assertion offered by Holmberg and demonstrated

how employees need company leaders' support at each level of learning to ensure the resolution of issues as they occur. Then and only then, company leaders may be able to integrate technology without an interruption in the delivery of the company's daily operations (Kawakami et al., 2014; Tondeur et al., 2017). Organizational leaders serve as the primary integrators of any technology initiatives into a company's daily operations. It is essential those leaders be included in all development and planning of any integration effort (Guo et al., 2016). Organizational leaders who do not include employees in technology integration are leading companies in danger of irrelevance (Hori, 2011). The lack of progress and behaviors of employees of the organization who are unprepared to meet the demands and needs of businesses and industries provide evidence of such irrelevance (Guo et al., 2016; Kawakami et al., 2014; Tondeur et al., 2017).

Beliefs and perceptions, attitudes and actual workplace practices affect technology integration and acceptance in the workplace (Klassen & Tze, 2014). Klassen & Tze (2014) researched technology integration with a focus on such attitudes and practices and discovered four primary variables affecting company leaders and integration. Those four variables included perceptions, knowledge, training method, and instructional context (Klassen & Tze, 2014). Results of the Klassen and Tze study indicated many leaders are confident and positive about the use of technology, yet there is often little to no use of technology in their respective departments due to a lack of comprehensive implementation strategies.

Successful organizational leaders provide accountability standards in technology integration efforts (Kim-Soon et al., 2016). Leaders might include such principles as the

creation of performance measures or critical success factors (CSFs; Baker et al., 2015; Glenn, 2016; Kim-Soon et al., 2016). Kim-Soon et al. (2016) investigated CSFs required for successful technology integration. Kim-Soon et al. concluded the primary problem with integration centered on the unfamiliarity with technology on the part of the participants, thus causing a lack of learning and integration. The group also discovered that observation provided a revelation supporting a direct correlation between the use of CSFs and measurements associated with each factor. Kim-Soon et al. concluded that by incorporating CSFs into the technology integration equation, organizational leaders may reduce some of the anxiety associated with integration. Company leaders must ensure adequate provisions for learning, support, and encouragement to all employees to ensure organization-wide technology integration occurs (Kim-Soon et al., 2016).

Citing statistics from the NCES, Ruhi (2016) contended some leaders in America lack adequate knowledge to use technology to augment training. In addition, older employees embrace and accept technology integration less often than their younger counterparts (Ruhi, 2016). Problems occur with employees inadequately trained to achieve success with integration and who are unwilling to learn new skills (Teo, 2014). Organizational leaders should ensure employees at all levels of longevity understand the mechanics and the importance of integrating technology (Ruhi, 2016). Even if organizational leaders understand some aspects of how various technologies work, there is no guarantee effective technology integration will occur due to a lack of learning and adequate training (Ruhi, 2016).

Company leaders' thoughts, perceptions, attitudes, and behaviors affect technology implementation strategies (Braun et al., 2015; Daniel, 2015; Lin et al., 2014). Braun et al. (2015) studied the thought and planning processes associated with implementing technology into any organization based on competencies. Individual motivations of employees to learn new technologies are also a critical element in technology integration. However, many employers are wary of employees gaining such knowledge in fear they may require higher pay or the employee would find new employment (Braun et al., 2015). The Braun et al. study included a comparison of public and private companies as related to integration and demonstrated there are many differences in how the two categories of companies assimilate technology into the workplace. For example, the researchers discovered that employees in public universities were more encouraged to learn new technologies than those employed in private industry (Braun et al., 2015). Braun et al. contended future research might include an examination of individual and organizational motivations for integrating technology.

Company leaders must align policies, procedures, and strategies with the mission and vision of the organization for valuable learning and technology integration to occur (Putman, 2014). Morreale et al. (2015) reviewed the mission statements of various establishments. Each of the evaluated mission statements included elements referring to offering a world-class workplace (Morreale et al., 2015). Leaders of organizations, educational institutions, and industries who fail to include technology strategies in current operations may find difficulty in accomplishing overall objectives (Galloway & Lesaux, 2014; Morreale et al., 2015; Putman, 2014; Rahim, Tie, & Begum, 2014).

Training. Professional development training is commonplace among both private and public sector organizations in the United States (Spanos & Sofos, 2015). There are many benefits associated with professional development training and those benefits often outweigh the limitations of such training (Spanos & Sofos, 2015). Nonetheless, in the technology arena, there is much evidence from research to support the idea professional development training is inadequate in training company leaders for technology integration (Donnell & Gettinger, 2015; Spanos & Sofos, 2015). In many cases, the brunt of responsibility for integration falls to untrained employees (Visnjic et al., 2017). However, the lack of or inadequacies associated with technology integration is not the responsibility of middle or lower level managers (Spanos & Sofos, 2015). Such accountability falls on top management leaders to ensure technology learning, integration, and training occur (Donnell & Gettinger, 2015; Spanos & Sofos, 2015; Tondeur et al., 2017).

The fundamental beliefs and perceptions of organizational leaders about technology affect operational processes and procedures. Holmberg (2014) researched such barriers associated with technology integration and acceptance in a study focused on public education (grades K-12). Still, the researcher offered many implications for business and industry, as well (Holmberg, 2014). There are various stages of change associated with technology integration and acceptance. Individuals exhibit different behaviors at each stage (Holmberg, 2014). Initiating the appropriate conduct at a specific stage determines the success of the integration (Holmberg, 2014). Klassen and Tze's (2014) research supported the results of the Holmberg research in that many

organizations currently do not offer employees the appropriate technology instruction or training. Employees often report a lack of flexibility and attention to individual needs with most technology training (Klassen & Tze, 2014).

The number of professional development training programs has increased over the past decade (Spanos & Sofos, 2015). However, there is still no manner in which to gauge the quality and effectiveness of such training, how employees learn from the training, nor how such training affects outcomes and achievements (Donnell & Gettinger, 2015; Spanos & Sofos, 2015). Most participants in the Spanos and Sofos (2015) study reported past training was too generic to apply to current technologies, and guidance was inadequate to provide for successful integration. Spanos and Sofos concluded that as the results of the generic training indicated, it has become evident that leaders should provide not only visionary leadership, but also all of the strategies, tools, elements, support, and training employees need to learn and integrate technology.

The primary problem with most training programs in the United States is professional development trainers often only inform the employees of new policies, regulations, and guidelines relating to technology (Huang & Chiu, 2015). Customized trainers for specific technologies provide for a more efficient integration when held within an appropriate setting conducive to learning (Huang & Chiu, 2015). In such a situation, trainers should offer ways for individuals to learn applications, which demonstrate problem-solving, and relevance to the intended job (Huang & Chiu, 2015). Furthermore, Huang and Chiu (2015) concluded that follow-up training and evaluations could serve to foster increased technology integration in the workplace.

In conjunction with professional development training, some organizational leaders in the United States created mentoring programs and communities of practice (Hooley et al., 2015; Paver et al., 2014). Quintana and Zambrano (2014) developed a systems-based model to help analyze the effects of technology integration using mentoring and communities of practice. The model developed by the pair included four steps to technology integration and emphasized the use of mentors to alleviate many of the barriers associated with such integration (Quintana & Zambrano, 2014). Evaluation and assessment of such training activities by organizational leaders are also critical to establishing successful integration (Quintana & Zambrano, 2014). Donnell and Gettinger (2015) developed systematic evaluation guidelines to assist organizational leaders in gaining a better understanding of the effectiveness of professional development training focused on technology. These researchers offered a three-phase plan that included extensive evaluation activities (Donnell & Gettinger, 2015). Using the guide developed by Donnell and Gettinger, business leaders ensure employees gain useful knowledge through training and that company processes and operations improve.

There is a variety of tools available for use in integrating technology. Still, various factors hinder implementation of technology strategies (Schrum & Levin, 2016). To assess employee attitudes toward integration, Schrum and Levin (2016) conducted interviews with thirty participants selected randomly from a roster from each of three organizations. The most commonly reported hindrance of integration by respondents was the lack of adequate technology training (Donnell & Gettinger, 2015; Morosan, Dawson, & Whalen, 2017; Rienties et al., 2016; Schrum & Levin, 2016). Schrum and Levin

offered four recommendations concerning the integration of technology centered on training, mandated assessments, contact time of use of technologies, and creating avenues of communications for employees regarding technology.

Researchers in the current literature provided comparisons between different professional development training programs and the effectiveness associated with such programs (Kawakami et al., 2014). Kawakami et al. (2014) compared two different professional training programs, both focused on technology integration. Researchers of the mixed methods study examined any increase in participants' technology knowledge through professional development training centered on problem-based learning (PBL; Kawakami et al., 2014). Several researchers discovered that the levels of experience and confidence of participants directly affected the amount of technology integration (Bateh, Horner, Broadbent, & Fish, 2014; Hawkins, 2014; Kawakami et al., 2014; Ruggiero & Mong, 2015). Dole, Bloom, and Kowalske (2015) used a Likert scale for participants to report responses in online surveys and concluded that the results indicated there were big increases in participants' technology knowledge. The group discovered that increases in experience and levels of confidence showed that inclusive professional development training does work in integrating technology in the workplace (Dole et al., 2015).

While the results of the Dole et al. (2015) research were overwhelmingly optimistic, there were several limitations to the study. First, there were no actual workplace observations used (Dole et al., 2015). The responses provided by the participants may have included biases in the levels reported for technology integration (Dole et al., 2015). The group contended that future research might include an assessment

of employee achievements to determine if the findings were accurate (Dole et al., 2015). One suggestion in the study was more appropriate levels of integration may occur if participants help select the technology used (Dole et al., 2015). While there are limitations and suggestions for future studies, Dole et al. (2015) supported the idea training programs can be beneficial in assisting organizations with technology integration. The group concluded that while professional development and other tools provide for success in integration efforts, there is no systematic manner to teach company leaders how to integrate technology (Morosan et al., 2017; Ruggiero & Mong, 2015; Salinas, Nussbaum, Herrera, Solarte, & Aldunate, 2017). Salinas et al. (2017) contended the six foundations identified in the current literature might provide a base for further development in generic technology integration.

By establishing comprehensive implementation strategies, company leaders are more likely to encourage more employees to assist with technology integration (Salinas et al., 2017). To increase the likelihood, Salinas et al. (2017) instituted a system to assist organizational leaders with implementation efforts. The pair created domains and competencies associated with each of six foundational areas and tested the approach on individuals within one organization (Salinas et al., 2017). By establishing clear directives and competencies with each type of technology training, employees were more comfortable with integration activities (Salinas et al., 2017). While the Salinas et al. approach has limitations centered on the lack of measurements associated with social, ethical, and legal variables of the participants, it does serve as a starting point in creating effective training strategies aimed at preparing employees for technology integration.

Technology trainers use both seated instruction and online education to teach employees technology (Geeraerts, Vanhoof, & Van den Bossche, 2016; Morosan et al., 2017; Schrum & Levin, 2016). Geeraerts et al. (2016) assessed the implementation and success of online technology training for employees. In the Geeraerts et al. study, researchers explored the influence of learning styles on integration. The group discovered that the integration of technology into the technology training process improved the employees' effectiveness, increased the employees' knowledge base, and enhanced self-esteem regarding the use of technology (Geeraerts et al., 2016; Price et al., 2014).

Instructors and trainers must use various teaching strategies to help integrate technology into the workplace (Wu et al., 2015). Wu et al. (2015) researched the similarities and differences between two separate training strategies: direct training and differentiated training. Teaching strategies, like learning styles, require different application and execution by instructors and trainers (Wu et al., 2015). The reasoning behind those differences lies in that individuals learn differently (Wu et al., 2015). The successful application of a variety of training strategies by organizational leaders only serves to benefit employees (Zheng, Warschauer, Lin, & Chang, 2016; Wu et al., 2015). There are noted differences between the two types of training. For direct training, trainers lead the group in an organized and structured, lesson-plan format (Wu et al., 2015). For differentiated training, members of the learning group assemble in a group format, but with more flexibility and individual guidance by the trainer (Wu et al., 2015). What sets the two strategies apart is that in differentiated training, the trainer aligns the instructions

based on the learning style of individuals, which provides each group member with individualized guidance (Wu et al., 2015).

Several researchers have investigated specific areas of study concerning online technology training. Price et al. (2014) analyzed the integration of geospatial technologies into one organization and used a variety of methods in collecting data and information for the study. The group utilized a 5-Step GT Program for the research and provided guidance, knowledge, and instruction for participants beginning with basic computer instruction (Price et al., 2014). Upon culmination of the program, participants served as leaders on the organization's committees regarding the integration of the geospatial technology (Price et al., 2014). Price et al. concluded that nearly one-half of employees who had access to the technology and software had not integrated it into processes and operations. The group also discovered that the employees did not plan to use the technology, even though it was available (Price et al., 2014). If company leaders are to prepare employees for a global workplace, the reported percentages regarding technology integration are unacceptable (Baker et al., 2015; Price et al., 2014).

Culture. Internal culture and structure regarding technology integration and its application within the business are influenced primarily by an organization's leaders (Anthony & Patravanich, 2014). Organizational leaders play an integral role in assuring the internal culture and structure are amenable to technology (Anthony & Patravanich, 2014; Donate & de Pablo, 2015). Anthony and Patravanich (2014) explored how the relatively new role of technology leaders served to develop, nurture, promote, and encourage integration efforts. Using activity theory as a base, Anthony and Patravanich

were able to research the art of human behavior concerning leader participants in the technology integration process. The pair found that when internal processes and systems were in alignment, improvement in technology integration and acceptance occurred (Anthony & Patravanich, 2014). The researchers also demonstrated how individual leaders' behaviors and ill-fitting policies and procedures at some organizations hampered integration efforts (Anthony & Patravanich, 2014).

Many existing organizational leaders have allotted technology positions; yet, few of those are viewed as leadership positions (Anthony & Patravanich, 2014; Bateh et al., 2014; Donate & de Pablo, 2015; Hawkins, 2014; Lin et al., 2014). When organizational leaders were in harmonious agreement with the plan for integration, success occurred (Anthony & Patravanich, 2014). It is imperative for business leaders to acknowledge the vital role technology positions play in the conducting of business (Bateh et al., 2014; Hawkins, 2014). For successful integration of technology, supportive and visionary leadership must be present in any organization (Bateh et al., 2014; Donate & de Pablo, 2015; Fichman & Melville, 2014; Hawkins, 2014; Wang, Hawkins, & Berman, 2014).

The role of organizational leader has evolved to include many characteristics not present in traditional definitions and responsibilities associated with leadership (Bateh et al., 2014). Leaders who encourage change and innovation and who embrace technology demonstrate the highest success with an organization (Bateh et al., 2014; Hawkins, 2014). Additionally, leadership has become a critical component of organizational operations (Hernaus & Vokic, 2014). The reason for a renewed focus on leadership is most American workers are not offering a full commitment to the workplace (Hernaus &

Vokic, 2014). Hernaus and Vokic (2014) found an overwhelming percentage of employees in America are not fully committed to their jobs and, over time, became less engaged with their jobs. Creating job engagement in a manner which encourages creativity is a responsibility of organizational leaders since training and retraining are one of an organization's largest expenses (Hernaus & Vokic, 2014; Konings & Vanormelingen, 2015). Hernaus and Vokic discovered that the release of such creativity creates a stimulating environment in which to work and increases productivity and profitability at the same time. The pair concluded that the challenge for organizations lies in finding individuals who possess the leadership characteristics to achieve both of these aspects within the organization (Bateh et al., 2014; Hawkins, 2014; Hernaus & Vokic, 2014; Konings & Vanormelingen, 2015). The focus for organizational leaders lies in developing and retaining individuals with visionary leadership, emotional intelligence, and technical skills (Hernaus & Vokic, 2014).

Company leaders and middle management supervisors must possess leadership principles and behaviors accepting of technology for integration efforts to become successful (Koh & Chai, 2016; Lin et al., 2014). It is the beliefs, attitudes, perceptions, and behaviors of leaders that influence each operation of an organization (Koh & Chai, 2016; Lin et al., 2014). Koh and Chai (2016) researched the beliefs of leaders concerning the impact of organizational environments on technology integration. The pair concluded that there remains a tremendous lapse between the funding spent on technology resources and the amount of integration in classrooms as demonstrated by the many investments made in public educational institutions (Bateh et al., 2014; Hawkins, 2014; Koh & Chai,

2016; Wang et al., 2014). In the Koh and Chai study, participants reported successful technology integration required various types of leadership and better-trained leaders to assist in executing the overall implementation of any technology initiative.

Technology integration and knowledge sharing is the nucleus of any company operation (Junker & van Dick, 2014). For technological change to occur, it is critical that leaders first be effective as leaders (Junker & van Dick, 2014). Junker and van Dick (2014) investigated the influence of leadership, specifically implicit leadership. The pair discovered there are many desirable and undesirable behaviors associated with such administration (Junker & van Dick, 2014). The fact is some leaders possess ineffective characteristics when it comes to leading a 21st-century workforce (Junker & van Dick, 2014). Junker and van Dick included exploration of many leadership characteristics; however, three were strongly associated with technology integration and training. For leaders to successfully execute technological change initiatives, they must first be open-minded, knowledgeable, and interested in new ideas (Junker & van Dick, 2014).

Much of the literature I reviewed addressed various issues identified as barriers to technology integration and training. However, there was limited information available concerning actual implementation strategies associated with technology training. Responsibility for successful development of implementation strategies lies with business leaders as they are the individuals responsible for organizational learning, training, and culture of the organization. Ruhi (2016) contended that some business leaders in America lack adequate knowledge to use technology to augment training. Even if organizational leaders understand some aspects of how various technologies work, there is no guarantee

effective technology integration will occur due to a lack of learning and adequate training (Ruhi, 2016). However, business leaders' thoughts, perceptions, attitudes, and behaviors affect technology implementation strategies (Braun et al., 2015; Daniel, 2015; Lin et al., 2014). An exploration of the TAM and how various elements affect technology training may provide for a better understanding of how the elements of thoughts, perceptions, attitudes, and behaviors of business leaders influence integration efforts. The content of the literature review for this study supported my objective and goals for this study to identify what strategies business leaders use to integrate technology into their organization.

Transition and Summary

Organizational leaders are changing the workplace with new machining technologies and have discovered challenges in the skills and abilities of all employees through the restructuring of processes requiring higher levels of technology knowledge than those of traditional manufacturing jobs (Baard et al., 2014; Butcher & Jameson, 2016; Kang et al., 2016; Riaz, 2015). The lack of adequate and beneficial technology-training strategies and programs in machining organizations has created a divide regarding competitive advantage among some companies in the industry (Jimenez et al., 2015). Organizational leaders must now concentrate on the development of new training strategies that may include organizational-wide change (Koh & Chai, 2016; Yoon, 2016). Technology training, integration, and acceptance is one area in which organizational leaders must establish effective operational strategies that lead to increased organizational efficiency (Riaz, 2015; Yoon, 2016). The imminent retirement of Baby Boomers further

intensifies the need for business organizations to retain and train employees in the machining industry (Visnjic et al., 2017).

With business leaders and employees at varying levels of technology competency, there is an even greater need for strong leadership capable of leading companies and developing training strategies and programs to ensure all employees are technologically adept (Koh & Chai, 2016; Riaz, 2015; Yoon, 2016). Koh and Chai (2016) concluded that those organizations with no technology-training strategies were falling further and further behind. A lack of such critical operational strategies not only affects the bottom line and operations for the organization, but it also provides a tremendous disservice to all employees in the lack of opportunities for optimal achievement (Baard et al., 2014; Butcher & Jameson, 2016; Kang et al., 2016; Koh & Chai, 2016; Riaz, 2015; Yoon, 2016).

Using the TAM as a guide to technology acceptance may offer insights for leaders to improve the effectiveness of company training strategies (Riaz, 2015; Yoon, 2016). Researchers provided evidence throughout the literature offering clear explanations of how technology acceptance as a whole might help company leaders to obtain a competitive advantage, higher profits, and more overall organizational success (Jimenez et al., 2015; Kang et al., 2016; Yoon, 2016). The TAM offers useful information to guide leaders in how to ensure technological success through effective training strategies and programs (Kang et al., 2016; Riaz, 2015; Yoon, 2016).

Some prior researchers focused on technology training at the organizational level (Hori, 2011). However, there are few organizations with technology leadership positions

(Molinillo & Japutra, 2017). The evidence provided by the researchers demonstrates that those organizations with technology leadership positions at the highest level of administration were more often than not, leaders in their respective industries (Hori, 2011; Gavankar, Suh, & Keller, 2015; Hill & Birkinshaw, 2014). Other researchers have determined that there are direct correlations between organizational success as demonstrated by competitive advantage and inclusion of technology positions at the highest leadership level (Butcher & Jameson, 2016; Fairman & Mackenzie, 2015; Hamidianpour et al., 2016; Jimenez et al., 2015; Junker & van Dick, 2014). It is also imperative for organizational leaders to develop technology implementation strategies allocating appropriate resources and training opportunities across all operations of the organization (Brettel et al., 2014; Choi et al., 2015; Hamidianpour et al., 2016; Hori, 2011; Wiesner, Padrock, & Thoben, 2014).

For the workforce to function at optimum efficiency, there is a demonstrated need for a workforce equipped with higher technology knowledge and skill sets (Dong et al., 2017; Hamidianpour et al., 2016). For higher levels of technology-use to occur, increased use, acceptance, and appropriate, as well as effective, training opportunities may be required to achieve full technology integration. Development of appropriate and meaningful training strategies by business leaders should include an assessment of current training programs and include a focus on measurable outcomes (Dong et al., 2017; Hamidianpour et al., 2016). While this study did not include a focus on change management, it is incumbent upon organizational leaders to assess the impact(s) of any

changes regarding technology strategies on its workforce (Burnes & Bargal, 2017; Dong et al., 2017; Jimenez et al., 2015).

The purpose of this qualitative, case study was to explore training strategies that SME machining business leaders use to implement technology integration and training. Section 1 includes a review of the issues and barriers associated with technology training. Section 2 includes a detailed narrative of the processes and procedures used in the study, as well as a description of my role as the researcher. Also included is a detailed narrative regarding the research method and design, as well as information regarding the reliability and validity of this research. Section 3 includes a presentation of the findings from the research and implications for developing training strategies that assist in developing a workforce with higher technology knowledge.

Section 2: The Project

In Section 2, I explain the qualitative research design, instruments, and data analysis techniques I selected for exploring the research problem. This section also includes an overview and detailed information regarding the selection criteria for the study's participants. I explain the data gathering process and procedures I used to ensure reliability and validity of the study results. This section contains an explanation of the measures used to ensure the confidentiality and protection of the participants and their responses. This section also includes detailed information concerning the ethical measures I used in the study.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies that machining industry business leaders in SMEs used to implement technology training. The targeted population comprised machining industry business leaders at three SMEs in the Southeastern United States who had successfully used technology-training implementation strategies. The selected population was appropriate because researchers have indicated that the lack of support from business leaders regarding technology use posed a threat to businesses desiring to improve their standing in an industry (Brettel et al., 2014; Jimenez et al., 2015; Visnjic et al., 2017). The contribution to social change could occur through a workforce with higher technology skills who are better prepared to participate in the workforce, and thus, potentially provide a better quality of life for themselves and their families.

Role of the Researcher

A qualitative researcher's role is critical because there are provisions for flexibility and exploration of a specific phenomenon through a lens based on personal experiences (Grossoehme, 2014; Wilson, 2015; Yin, 2018). With such flexibility, the researcher provides for a more comprehensive exploration of the problem through the gathering of the data and the creation of the research questions, data analysis, and documentation (Grossoehme, 2014; Wilson, 2015; Yin, 2018). However, biases may surface through such flexibility (Marshall & Rossman, 2016).

As a faculty member in the machining department at a community college, I was familiar with some of the individuals employed by the selected organizations and some of the companies' processes and operations. However, I had no personal or professional connections to any of the business leaders. The individuals I worked with previously within the three organizations are in middle management or their subordinates. While I am currently a faculty member, I also possess prior work experience in a machining company.

For this study, I used face-to-face semistructured interviews and organizational documentation as the data. Participant responses to interview questions served as the primary data. During the interviews, I asked open-ended questions. According to Lantos and Spertus (2014), open-ended questions provide a more natural response and negate the possibility of participants responding in a prescribed manner. I maintained a neutral position in all areas of the study and ensured that I did not insert comments or opinions with the participants' responses; otherwise, individuals may have responded in a way

perceived as desired by me. By excluding my comments and opinions, I ensured elimination of unintended biases. I also maintained professional and courteous behavior in my body language so as not to influence any responses.

I followed the protocol outlined in *The Belmont Report* to assist in further elimination of biases. *The Belmont Report* included research a protocol that was critical to eradicating bias in research data collection (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). As the researcher, I provided respect, confidentiality, impartiality, and protection to all participants. Individuals experienced no harm in any manner through participation in the study, as there was no personally identifiable information included. I used pseudonyms to identify participants and organizations. The procedures for masking participants and organizations are included later in this section. finally, I ensured the fair and equitable treatment of all individuals. For this study, I used face-to-face-semistructured interviews and followed an interview protocol (see Appendix). I scheduled interviews at a date, time, and location convenient to each participant with each informal interview lasting approximately 1 hour.

To ensure agreement with *The Belmont Report* protocol, I maintained professional behavior and composure during the face-to-face interviews with conscious attention to body language, posture, facial expressions, and so on. Such attention ensured that I did not influence the responses in any manner (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). For research to be credible, it is essential that the researcher mitigate any bias associated with the study (Marshall & Rossman, 2016). Conscious attention to my behavior assisted in removing

any preconceived biases or assumptions I had based on work and personal experience (Baillie, 2015; Thorne, 2016; Wilson, 2015; Yin, 2018). Such biases had the potential to affect the findings of the study. To ensure elimination or limitation of biases, I adhered to all ethical principles described in *The Belmont Report* (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) and guarded against the injection of my opinions, ideas, and beliefs. Avoiding such interference renders the research more credible (Baillie, 2015).

Participants

In qualitative studies, defined and developed participant selection criteria helps the researcher ensure that individuals are equipped with adequate knowledge and experience to contribute to the research (Marshall & Rossman, 2016; Palinkas et al., 2015; Wilson, 2015). For this study, eligible participants included business leaders at three machining SMEs in the Southeastern United States who had technology-training implementation strategies. The individuals were leaders in a machining organization with knowledge and work experience in the machining industry. Participant criteria for this study included working in a leadership position for a minimum of 5 years in the machining industry to ensure appropriate knowledge and experience regarding the topic. Such characteristics ensured participants possessed adequate knowledge and experience to respond to the interview questions (Wilson, 2015).

As leaders, each of the participants worked in a broad range of departments, offering a wide array of technologies for use in training. Additionally, some leaders had access to the Internet, e-mail, and various other forms of technology for use in

performing a variety of job responsibilities. Through data analysis, I determined common attributes or characteristics isolated to the various leaders while also collecting data concerning any particular strategies used for technology training.

After gaining approval from my doctoral study committee and Walden University Institution Review Board (IRB), I contacted possible participants by telephone. My strategies for selecting the community partners came from personal knowledge. In my current job, I have developed knowledge of, and often a working relationship with, various machining businesses in the local area. Individuals at those organizations are responsible for developing implementations strategies for technology training, as well as planning processes. I drew on my past knowledge and work experience to strategically select the organizations for this study. Each of the individuals serving as a contact were open to participation in this study and interested in the findings of the study, especially in regard to best practices.

Once the participant pool was established, I gained access to participants by contacting them by telephone and inviting individuals to participate in the study. To build a relationship and achieve rapport with the members of the group, I offered an introduction of myself, as well as a summary of my educational and work experience. I attempted to establish common ground through our interests based on the machining industry. After explaining the study in detail, I scheduled individual appointments with consenting participants.

Included in the discussion with potential participants was a statement of the purpose of the study and information regarding informed consent. Participants

demonstrated a willingness to participate (see Marshall & Rossman, 2016; Palinkas et al., 2015; Yin, 2015) and signed a consent form before participating in the study.

According to Baillie (2015), it is important to include a description of the participants to place the research into perspective. Portrayals of participants typically include demographic information, specialty area and expertise, and education as well as employment background information. In this study, such demographic elements may influence the amount of technology integration and training occurring in the workplace (see Baillie, 2015; Thorne, 2016). In the results section of the study, I show any specific similarities and differences in participant responses.

Research Method and Design

I used a qualitative case study method to conduct the research because it allowed for exploration of a specific phenomenon through business leaders' perspectives. The flexibility of qualitative research also allowed me to ask open-ended interview questions, permitted participants to explain responses, and afforded the opportunity for non-structured exploration (Yin, 2018). The qualitative method also allowed me to use exploratory inquiry in a natural setting, provide respect for participants, and offer the opportunity for changes as new developments and information emerged (Marshall & Rossman, 2016).

Case studies can be qualitative or quantitative and usually allow researchers to provide a broader base of data collected, thus expanding the information base (Baillie, 2015). For example, my inclusion of adaptability and accommodation in the final report allowed for the inclusion of participant perceptions and beliefs (Baillie, 2015). I used a

case study format to gain a greater understanding of a particular issue in a current and natural setting, which was the deciding factor for selecting the method (Baillie, 2015; Grossoehme, 2014; Thorne, 2016; Wilson, 2015; Yin, 2015). Case study design allowed me to explore technology implementation strategies developed by or in use by business leaders and the extent to which those leaders used technology to achieve optimal efficiency in technology integration and training. Through this research with a focus on a real business scenario and offering possible solutions to problems, I provided results that may make a positive impact on organizations through increased knowledge regarding development of implementation strategies for technology training.

Research Method

There are fundamental differences between qualitative research, quantitative research, and mixed-methods research. In qualitative studies, researchers gather information from behaviors or events to explore the topic at hand (Thorne, 2016; Wilson, 2015; Yin, 2018). Additionally, researchers may use elements within qualitative data to provide a broader understanding of the overall research (Baillie, 2015; Thorne, 2016; Wilson, 2015; Yin, 2015). For qualitative research, the general characteristics are flexibility, variety, evolution, inherent dependence on the role of the researcher, and a natural setting (Baillie, 2015; Thorne, 2016; Wilson, 2015; Yin, 2015). All of those characteristics were at work in my study.

As in the case of this study, qualitative research often begins with a researcher asking a simple question regarding why a situation or problem exists (Baillie, 2015; Marshall & Rossman, 2016; Yin, 2018). Next, the researcher explores how the

phenomenon affects various other elements or situations within boundaries (Baillie, 2015; Wilson, 2015; Yin, 2015). According to Baillie (2015), the researcher is responsible for establishing narrow parameters to assist in comprehensively explaining the problem. Researchers use the quantitative research method to establish a hypothesis and often include experiments with several variables (Yin, 2018). Due to those complexities, the researcher chooses quantitative research to examine a situation in a scientific or numerical manner (Yin, 2018). In quantitative research, the overall meaning of the phenomenon vanishes as the focus is primarily on numbers (Baillie, 2015; Robinson, 2014). Another disadvantage to this type of research is that a large sample is required to ensure statistically accurate results (Baillie, 2015). Mixed method researchers use a combination of both qualitative and quantitative data, allowing the researcher to focus on positive attributes from both methodologies (Yin, 2018). However, mixed methods research is very complex, and requires that researchers invest large amounts of both time and resources in implementation (Baillie, 2015).

Other differences in research methods are evident in how research integrity is established (Noble & Smith, 2015; Wilson, 2015; Yin, 2015). For example, in qualitative inquiry, the role of the researcher is paramount in establishing confidence, validity, and reliability of the findings, analysis, and summary of the study (Noble & Smith, 2015; Wilson, 2015; Yin, 2015). The boundaries and parameters of qualitative inquiry are quite broad and include a close examination of human experiences of a particular phenomenon (Baillie, 2015; Marshall & Rossman, 2016; Wilson, 2015; Yin, 2015). Qualitative researchers work in natural settings involving real life scenarios (Baillie, 2015; Thorne,

2016; Wilson, 2015; Yin, 2015). Furthermore, qualitative studies are an excellent choice for exploring a business problem that encompasses evolving events or, in this case, new technologies (Baillie, 2015; Thorne, 2016; Wilson, 2015). The characteristics of qualitative research combined assisted me in deriving at the selection of a qualitative case study.

Research Design

For this qualitative study, I used the case study design. Within the parameters of the selected design, researchers gather data using responses to open-ended interview questions and archived documents (Marshall & Rossman, 2016). The use of different sources of data offers researchers a more accurate portrayal of the findings during data analysis (Yin, 2018). Researchers use the case study design for dependable and genuine exploration of an experience of a group allowing for research based on the fusion of experience of each member (Lantos & Spertus, 2014). The researcher then develops an in-depth account of such an experience through the data analysis (Lantos & Spertus, 2014; Parker, 2014). For those reasons, I used the case study design as it included an opportunity for exploration in a real-world scenario.

For a doctoral study, choosing the appropriate research design is often a daunting task. For the qualitative method, there are five types of design (Yin, 2018). While the five types are different, each includes fundamentals appropriate for qualitative inquiry allowing researchers to explore and understand an experience (Lantos & Spertus, 2014).

The phenomenological research design is suitable for studying lived human experiences. Researchers use the design to gain a distinctive portrayal of how individuals

have subsisted in a particular situation or phenomenon (Lantos & Spertus, 2014). While similar to case studies, there are differences regarding alterations in the experience and the guidelines established for data collection (Lantos & Spertus, 2014; Parker, 2014). However, researchers use no organized or distinct steps to the research (Marshall & Rossman, 2016). Some researchers prefer such an open format to research as it presents no limitation in creativity on the part of the researcher (Lantos & Spertus, 2014). I chose a research design to provide more structure.

The purpose of grounded theory design is to allow researchers to explore a situation or problem using theory development (Marshall & Rossman, 2016). The data collection methods for this design include providing for different stages of the theory carried out at the same time (Marshall & Rossman, 2016). This design also provides researchers an opportunity for selective sampling of participants and references and is more appropriate for social issues research (Lantos & Spertus, 2014). Grounded theory design also includes development, testing, and alteration of a scheme until a solid theory emerges (Marshall & Rossman, 2016). For those reasons, I did not select this research design.

Ethnography research design is appropriate for identifying and exploring the characteristics of a specified situation, group, or environment (Marshall & Rossman, 2016). Researchers using this design focus on uniqueness such as race, ethnicity, and economic factors and how each influences a culture (Lantos & Spertus, 2014). One of the fundamental elements of this design is that it includes an observation by the researcher of the culture over time (Marshall & Rossman, 2016). One of the requirements of

ethnography design is that the researcher is required to submerge themselves into the identified group or culture (Marshall & Rossman, 2016). This type of design did not fit appropriately within the context of the preferred study.

The historical research design is useful when the researcher wishes to explore past events in developing an understanding of a present situation and wishes to predict possible future occurrences (Lantos & Spertus, 2014). Researchers develop data analysis for this design centered on an amalgamation of all data collected, accepting or rejecting the data, and resolving any conflicting information (Marshall & Rossman, 2016). My reason for not selecting this design centered on the amount of time required for the research.

With a qualitative case study approach, a researcher conducts an in-depth exploration providing a better understanding of the actual real-world experiences (Baillie, 2015; Thorne, 2016; Wilson, 2015; Yin, 2015) of company leaders. Those experiences, documented through the data collected and the narratives provided by the participants, provide researchers to achieve a deeper meaning of the subject (Baillie, 2015; Parker, 2014). Therefore, I used a qualitative case study design with face-to-face semistructured interviews as the primary data collection tool for this study. The case study design with interviews allowed me to interact with those organizational leaders most closely connected to specific technology-training strategies. Including business leaders provided me the opportunity for gaining historical knowledge on how and why particular strategies were developed and used (Parker, 2014).

Through the collection of rich and solid data, researchers provide evidence of sound and valid research (Lantos & Spertus, 2014). Providing ample information for others to duplicate or repeat helps researchers ensure data saturation (Lantos & Spertus, 2014). Data saturation occurs when new data provides no new information, further coding of themes is not possible, and interview responses become repetitive (Baillie, 2015; Lantos & Spertus, 2014; Robinson, 2014). I achieved the desired level of richness and thickness to ensure data saturation and adequate answers for the research question through the interview responses of the nine participants. However, no repetition from interview responses among participants would have indicated a need for additional participants (Baillie, 2015; Grossoehme, 2014). The use of case study design allows researchers' interpretation of the individual participant responses based on the individual perceptions and life experiences and common practices (Baillie, 2015; Marshall & Rossman, 2016; Wilson, 2015; Yin, 2014; Yin, 2015).

Population and Sampling

In qualitative research, researchers use an exploratory inquiry to understand how individuals ascribe to a particular problem or experience (Thorne, 2016). Successful qualitative researchers focus on organization, development, and administration of the data collection procedures (Marshall & Rossman, 2016). However, one of the most critical components facing a qualitative researcher is the selection of the participants (Robinson, 2014). For this study, I selected participants representative of a sample from a population of business leaders in SME machining organizations. I determined the sample of participants through stratified purposeful sampling. By using stratified purposeful

sampling, I focused on a particular industry (machining) and SMEs at the same time (Marshall & Rossman, 2016; Robinson, 2014). One disadvantage to stratified purposeful sampling was that the number of selected participants might be too small to generalize the findings of the study across other industries (Robinson, 2014).

Palinkas et al. (2015) contended that purposeful sampling serves a fundamental purpose of qualitative research as it provides the opportunity for rich data collection through the selection of participants meeting specific criteria. For this study, I chose company leaders possessing both knowledge and experience (Palinkas et al., 2015; Robinson, 2014) regarding technology integration and training strategies in the machining industry. Additionally, by selecting participants with 5 years of work experience, I provided for assurance of knowledge of responsibilities.

For this study, I completed face-to-face semistructured interviews with a sample of nine individuals who served as business leaders in three different SME machining organizations in the Southeastern United States. Responses to open-ended semistructured interview questions allowed me to explore individual experiences with technology integration and acceptance. For data saturation, adequate information equated to ample data collection and served as the point when additional participant responses would provide no new information (Palinkas et al., 2015). No point of replication of information in responses indicates a need for more participants (Robinson, 2014).

For semistructured interviews to serve their intended purpose, it was imperative that I prepared for the interview. I contacted each participant in advance by telephone and outlined the goals of the interview. The interviewee also selected the appointment time

and location of the interview, as it was vital for each to feel at ease and relaxed (Baillie, 2015; Parker, 2014). The location was agreeable to both parties and in a location that provided a quiet, comfortable atmosphere for both (Robinson, 2014). The selection of an appropriate setting for the interview by the participant helped establish an environment in which participants felt comfortable to discuss the topic (Wilson, 2015). I emailed or telephoned each participant to confirm the date, time, and location of the interview.

Sotelo (2015) used semistructured interviews with 16 participants to explore themes regarding technology acceptance. Sotelo (2015) contended that with semistructured interviews, participants had an opportunity to discuss their experiences and levels of knowledge regarding technology acceptance allowing for rich data collection (Sotelo, 2015). Erasmus et al. (2015) used survey methodology based on the technology acceptance model to explore employees' intent to use technology. While the group used survey methodology, providing participants a chance to expound on the responses, no provision for clarification of participant responses existed at the time of inquiry (Palinkas et al., 2015). Er and Kim (2017) used semistructured interviews to collect data regarding technology integration and acceptance in an educational setting. The 22 participants provided rich data about individual beliefs and their influence on technology acceptance (Er & Kim, 2017; Erasmus et al., 2015).

For a qualitative study, the researcher uses member checking or respondent validation to ensure the reliability and validity of the research (Marshall & Rossman, 2016). With member checking, participants provide feedback during an interview to ensure the accuracy of the data provided and proper interpretation by the researcher

(Marshall & Rossman, 2016). Abundant feedback from participants provides additional validation regarding transcribed data (Marshall & Rossman, 2016). At this stage, individuals verify the accuracy of the transcribed responses (Thorne, 2016). Completion and affirmation of the data collected from participants confirm the integrity of the research (Marshall & Rossman, 2016). Data saturation occurs at the time when the data collected from additional individuals provides no new or further information regarding the problem (Palinkas et al., 2015). Using nine participants' responses provided sufficient opportunity for responses to repeat. The non-occurrence of repetition in responses would have indicated a need for more participants for the study.

Ethical Research

Obtaining approval for the study before the collection of data ensured ethical research plans had been established (Grossoehme, 2014; Wilson, 2015). The IRB members at Walden University provided approval before any data collection for this study. The Walden University's IRB approval number is 09-26-18-0291466.

A participant's consent to participate was crucial to ethical research (Marshall & Rossman, 2016; Parker, 2014; Robinson, 2014). For this study, I discussed the informed consent form in the initial telephone call to each participant. Additionally, I provided a hard copy of the form via email. The informed consent form included the following information: background information, procedures, voluntary nature of the study, risk and benefits, privacy, contact information, and statement of consent. Signatures of the participant and the researcher appeared on the informed consent form before any data collection (Grossoehme, 2014; Wilson, 2015). Discussion regarding each of these areas

in the initial telephone call, as well as a follow-up email, assured that individuals were knowledgeable about all aspects of participation in this study. Additionally, the information presented in the initial telephone call and the follow-up email assured participants of the right to withdraw at any time from the research without penalty or retribution. Individuals also learned that there was no incentive to participate in the research.

Confidential reporting of the findings of a study reassured participants of confidentiality in all matters relating to the study (Grossoehme, 2014; Marshall & Rossman, 2016; Robinson, 2014). No personally identifiable information regarding the individual or any organization appeared in the study. I used pseudonyms to identify participants. During the interview, I reminded participants that no disclosure of their name or company occurred in the study. I masked participant identities with coded and assigned numbers, protecting individuals' identities and ensuring confidentiality. No information in which readers may identify the participants or the organizations represented appeared in the study. The secure storage of all data and responses related to the study protected the rights of the participants. All data and information will be stored in a locked safe for 5 years as required by Walden University, and then destroyed by fire. At no time will the information or any participant responses be available or disseminated to the public or any other individual.

Data Collection Instruments

As the researcher, I served as the primary data collection instrument for this study. Face-to-face semistructured interviews consisting of open-ended questions and

organizational documentation functioned as the data collection tools. The face-to-face semistructured interview method of data collection offered flexibility and fluidity in the responses (Baillie, 2015; Marshall & Rossman, 2016). I used established goals and identified objectives, facilitating the data recording and organization processes.

For this study, I explored implementation strategies used by business leaders for technology training in SMEs in the machining industry through interview responses to seven open-ended questions (see Appendix). The use of semistructured interviews was appropriate for interviewing numerous participants (Koskei & Simiyu, 2015). Such interviews allowed for initial questions and an opportunity to ask for clarifying information (Koskei & Simiyu, 2015). Responses from participants to the 7 open-ended questions provided the foundation for the study and established the framework for participants to respond in their chosen manner (Grossoehme, 2014). The use of information gained through interviews with organizational leaders and archival document review by me provided insight into the problem centered on lack of effective technology-training strategies and possibly revealed solutions to the problem.

Grossoehme (2014) concluded that it is imperative for researchers to ensure accuracy in the transcription of the interview responses when used for data collection. Such accuracy occurs through a transcript review by the interviewee and member checking (Baillie, 2015; Robinson, 2014). For this study, I recorded each interview using the iPhone Voice Recorder Plus application and recorded verbatim responses into a Microsoft Word document. The transcription process occurred within one week of the interview and interviewees received a copy of the transcription. It was also vital that I

conducted member checking to offer reliability and validity to the study as recommended by Baillie (2015) and Robinson (2014). Member checking was crucial to the validity of the study as it ensured that the researcher accurately understood the intended response from each interviewee.

Thorne (2016) recommended the use of several data collection sources to demonstrate triangulation. Additionally, Baillie (2015) contended that triangulation of the data helped establish credibility in research. The use of various sources (interviews and archival documentation) assures the researcher a representation of a broader lens in the final study (Baillie, 2015; Marshall & Rossman, 2016). Upon completion of the interviews, I reviewed company documents reading for pertinent information related to the study looking for relevant information regarding strategy development and technology-training strategies and programs, as well as changes in training strategies and processes.

Data Collection Technique

To achieve credible results, a researcher should employ various data collection tools (Koskei & Simiyu, 2015). I used face-to-face semistructured interviews as the primary data collection tool, while organizational documentation served as secondary tools. Recorded interviews are one method of data collection in qualitative research (Yin, 2018) and allow the researcher to gain a better understanding and deeper meaning into an occurrence (Koskei & Simiyu, 2015). One advantage of face-to-face semistructured interviews is that it offers the researcher an opportunity for individual interaction with participants (Wilson, 2015). Through the interview process, the researcher may discover

personal perceptions that provide rich data regarding the research question (Robinson, 2014). For this study, I utilized face-to-face-semistructured interviews and followed an interview protocol (see Appendix) allowing for scheduling at a date, time, and location convenient to each participant with each interview lasting approximately 1 hour. During the interviews, I summarized and repeated responses as necessary and asked follow-up questions when warranted. My field notes included observations made during the interviews. I thanked participants for their contribution at the end of the interview and scheduled a follow-up transcript review and member checking session.

For a qualitative study, the researcher uses member checking or respondent validation to ensure the reliability and validity of the research (Marshall & Rossman, 2016). With member checking, researchers have an opportunity for feedback from participants during or after an interview to ensure the accuracy of the data provided and proper interpretation by the researcher (Marshall & Rossman, 2016). Researchers use the abundant feedback regarding transcribed data for additional validation (Marshall & Rossman, 2016). Once those steps were completed, I offered participants an opportunity to verify the accuracy of the transcribed responses. Completion and affirmation of the data collected by the participants confirmed the integrity of the research.

Another advantage of semistructured interviews is that there is the opportunity for recording the interviews. Marshall and Rossman (2016) recommended the use of audio recordings of the interviews to assist in the transcription and analysis processes. One disadvantage to collecting data through face-to-face semistructured interviews is the time required to conduct each interview (Robinson, 2014). For this study, it was quite time-

consuming to analyze the data, as well. A final disadvantage centered on the fact that it was difficult to compare results as open-ended questions provided unique and individual responses and were more difficult to analyze or compare.

Researchers use interview responses in combination with the use of organizational documentation, providing for a richer collection of information, as well as triangulation of the data (Wijnhoven & Brinkhuis, 2015). Documents provided by the selected organizations served as archival data for the study. Such data collection was useful in research of historical comparisons and for analyzing trends. By using multiple data collection tools, I provided more reliability and validity to a study. However, there were some disadvantages to using archival data. The primary disadvantage to using archival data in this study with private organizations centered on the amount of information available to me. The documents provided to me were often limited information that the company did not wish to openly share. Finally, organizational documentation provided no opportunities for causal conclusions or observation of behaviors and mindset of participants.

As I used face-to-face semistructured interviews for data collection, there was no need for pilot interviews. Instead, I conducted an informal practice interview with a colleague to review data collection activities and interview questions. Data collected through in-depth interviews composed of open-ended questions (see Appendix), as well as organizational documentation, provided answers to support the validity of the research. The practice interview also helped determine if the interview questions were relevant.

After IRB approval, the first step in the data collection process was to conduct a practice interview with a colleague to assess the appropriateness of questions about technology training. The colleague from the practice interview also helped determine if the interview questions and the process were suitable for the planned study with company leaders. Through the practice interview process, the colleague assisted in validating the interview questions and processes and offered ideas and suggestions illustrating potential problems with the study as suggested by Wilson (2015) and Yin (2015). My evaluation of those elements above served to improve the research and offer a higher level of reliability and validity to the study. The Appendix includes a list of the questions used for the interviews. The adapted questions helped ensure appropriateness for organizational leaders, as well as reliability and validity of the developed instrument.

Data Organization Techniques

Researchers use written field notes, along with recorded interviews, as an opportunity for reflection of behaviors of the participants such as tone of voice, hesitations, and other miscellaneous notations (Baillie, 2015; Robinson, 2014; Thorne, 2016). The recorded interview and written field notes ensure researchers of less room for error in reporting the results (Noble & Smith, 2015; Wilson, 2015; Yin, 2015). My written interview notes provided for notation or comments of clarification regarding responses. Transcript review and member checking ensured the verbatim reporting of answers and provided less opportunity for error in reporting the findings. After the transcription of the interview responses, the transcript review and member checking processes occurred.

I had nine participants and three participating organizations. I assigned individual identifiers to participants that consisted of the letter P and a number for the individual and the letter O and a number for the organization. I assigned the following codes to participants: P1O1, P2O1, P3O1, P4O2, P5O2, P6O2, P7O3, P8O3, and P9O3. I used an iPhone Voice Recorder Plus application to record the interviews. I had two iPhone recorders at each interview with one serving as a backup. The audio recording of the face-to-face semistructured interviews was essential to the success of the research as it yielded a verbatim account of the individual's answers to each question. Additionally, my field notes aided the transcription process as they helped to reiterate the sincerity of the responses. The transcription process occurred within one week of the interview and I provided the interviewee with a copy of the transcribed responses. It was also vital that I conducted member checking to offer reliability and validity to the study. I used passwords, providing security for all electronic files utilized in the research. Printed instruments and data served as hard copy evidence of the data collected. I possess the only cabinet key and knowledge of all passwords. A locked, fireproof cabinet secures all data relating to the research. Such measures by the researcher ensure the participants' information and responses remain confidential (Baillie, 2015; Robinson, 2014; Thorne, 2016) and the information relating to the study is readily available for future review by me. After transcription, I provided a locked, fireproof cabinet located in my home for security of the recorded interview tapes, as well as all tables, figures, diagrams, documents, and other data relating to the study for 5 years as required by Walden University. I used pseudonyms to identify participants. There was no discussion of

specific details about the companies or their location in the study to preserve all confidentiality.

Data Analysis

Qualitative researchers collect data using semistructured interview responses leading to the collection of rich data (Wilson, 2015). For this study, I used face-to-face-semistructured interviews and followed an interview protocol (see Appendix). The organizational documentation augmented the data collection in conjunction with the verbatim interview responses. The use of multiple sources allowed for triangulation of the data (Yin, 2015). The four types of triangulation used in research are data triangulation, investigator triangulation, theory triangulation, and methodological triangulation (Wilson, 2015; Yin, 2015). Methodological triangulation was appropriate for this study as there were multiple sources used in data collection (Thorne, 2016). The use of multiple data sources aided in obtaining a broader base of information and provided support for validation of the findings (Grossoehme, 2014; Wilson, 2015). I used methodological triangulation as it allowed me to validate the results of the study through identification of repetitive terms and data. Use of multiple data collection tools also allowed for conclusions that presented a better analysis of the problem.

After collecting the data, I analyzed the information. The data analysis process involved Yin's (2018) five steps: (a) compiling, (b) dissembling, (c) reassembling, (d) interpretation, and (3) concluding. This method was appropriate for qualitative case studies as confirmed by Palinkas et al. (2015). Data analysis involved assembling, dissembling, and reassembling of the data to ensure a comprehensive interpretation of the

data. Data presented in only one manner by the researcher may have skewed the reader's understanding (Thorne, 2016; Wilson, 2015). The process of regurgitating the data allowed my determination of different categories, themes, descriptions, and patterns throughout the process. However, in the data analysis phase, I refrained from inserting my thoughts and opinions to avoid any researcher bias.

For the initial analysis, I transcribed each interview recorded with an iPhone Voice Recorder Plus application and then transcribed the data verbatim into a Microsoft Word document. I checked the transcribed information against the audio recording to verify the accuracy of the transcript as suggested by Parker (2014). I verified the accuracy of the transcript and used member checking to ensure the credibility of the results. Participants verified the accuracy of responses through a review of the transcripts.

The presence of more themes and patterns appearing in the data analysis allowed me to determine the emergence of additional and significant terms as recommended by Yin (2018). At this stage of data analysis, coding of the data by me supported the assembly of similar data providing for patterns in the data. I used Word and Excel software to code and identify themes for this study. Use of software such as Excel also assisted in identifying likenesses and connections in data and primary themes.

After the disassembly of the data, I began the process of reassembly of the information. At this point, themes emerged in the data and I began interpretation of the data. The data started to gain significance and allowed me to offer an individual perspective regarding the meaning of the data. During this phase of data analysis, questions continuously arose by me regarding the data. For example, I determined if there

were common patterns or themes associated with specific situations within the data. I also determined if there was a need for the collection of more data to ensure saturation. Still, another question centered on whether the emerging information supported the findings of other research. Concluding was the final phase of the data analysis process and allowed me to review themes and patterns demonstrating a direct link to the original research question as noted by Yin (2018). I then discovered a linkage to the conceptual framework and the literature. Following these steps and guidelines ensured that my reported responses and analysis were accurate.

The level of reliability and validity, credibility, confidence, and trustworthiness of any qualitative research is reliant upon the researcher (Baillie, 2015; Robinson, 2014; Thorne, 2016; Yin, 2015). Those elements are crucial to all processes and procedures used in a study, especially in data analysis. The data analysis phase permitted me to offer a presentation of the data in a manner demonstrating a comprehensive and accurate representation of the interpretations of the data. I used consideration and thoughtful preponderance of all related evidence associated with the research in conveying this representation.

Reliability and Validity

It is essential for researchers to demonstrate reliability and validity in research to provide for the legitimacy of the findings and to demonstrate trustworthiness, rigor, and quality (Grossoehme, 2014). Reliability of the research refers directly to the ability for future researchers to achieve similar outcomes based on comparable data and like participants and circumstances (Baillie, 2015; Grossoehme, 2014; Noble & Smith, 2015).

The researcher's credibility of the findings and results, as related to the information presented, provide validity to the research (Baillie, 2015; Noble & Smith, 2015; Yin, 2015). For me to demonstrate reliability and validity, it was essential to demonstrate trustworthiness and credibility of the data and results, as well as the processes and procedures used to conduct the study. Factual, accurate, and valid responses by participants to the interview questions helped me establish reliability. Researchers use methodological triangulation to achieve this goal, as in the case of this study.

Reliability

For dependability to occur in qualitative research, researchers emphasize changes occurring in situations or circumstances surrounding a particular phenomenon (Marshall & Rossman, 2016). For credible qualitative research, it is critical that researchers establish dependence and reliance in each of the areas associated with the findings of the study (Baillie, 2015; Noble & Smith, 2015). It was incumbent upon me to be firm, uncompromising, clear, and austere in all data collection methods and techniques and in presenting the findings of the research to ensure an accurate portrayal and analysis of the results. Credible researchers demonstrate clearly and concisely the data, collection methods, and analysis of the findings (Noble & Smith, 2015; Yin, 2015). Clear and concise articulation of all information associated with the study by me also demonstrated sound research of the particular phenomenon and included detailed documentation of the steps utilized. Qualitative researchers ordinarily demonstrate how various strategies combine to ensure reliability and validity (Baillie, 2015). In the final study, I provided evidence of those characteristics.

The researcher's accuracy of data and data collection techniques demonstrate dependability and help establish reliability (Noble & Smith, 2015; Thorne, 2016; Yin, 2015). My attention to detail ensured no human error in the reporting of the data or the findings and the removal of unintended biases. I used a practice interview with a colleague to ensure that interview questions were understandable and logical, and that no biases were evident. Additionally, I conducted a practice interview with an individual familiar with the machining industry to assist in developing dependability and to ensure the articulation of questions. The clarification of responses by me during the interviews further established dependability.

Through the careful mapping of the recommended procedures and processes for case studies, those researching in the future may ascertain the dependability of the results. I was solely responsible for ensuring definitions, communications, and crosschecks of the data were clear and unambiguous. Careful editing and proofing of interview transcripts on my part guaranteed no errors occurred. The responses from participant's interview questions and document review by me demonstrated a link to information and data available in the current literature to prove applicability, dependability, and reliability. Consistency in data collection, transcription, and interpretation of the data by me provided accuracy.

As the researcher, I was responsible for ensuring dependability and credibility of the data collected and the data analysis. I used member checking to assure dependability in the results of the study. Member checking allowed for my review of feedback from participants, which further ensured that I had interpreted the interview responses

correctly. I used member checking during and after the actual interviews. During the interviews, I rephrased questions or offered a summary of the response to ensure accuracy in my understanding and reporting. Upon completion of the study, I shared the results with the participants offering an opportunity for their comments and feedback. Once participants confirmed the accuracy of the results through member checking, credibility occurred.

Validity

Validity of qualitative research ensured credibility, addressed transferability, demonstrated confirmability, and guaranteed data saturation (Marshall & Rossman, 2016). Establishing validity in research requires various processes on the part of the researcher (Marshall & Rossman, 2016; Noble & Smith, 2015). For this study, such procedures included developing strategies assisting with interpretations of the results. Validity also helped me to illustrate how the results of the study are applicable in real-world scenarios. Validity provided me with the truthfulness component of the results. For this study, use of numerous data sources ensured credibility through the literature review, interviews with organizational leaders, my field notes, and a review of documents from the organization.

For this study, I used methodological triangulation for checking the accuracy of the findings as it ensured reliability and validity. In addition, my assessment of elements including time, strength, weakness, distribution, and dispersion of the various data collection techniques helped assess validity. To demonstrate validity, I illustrated the findings were valid and applicable for groups to study for use in the real world.

Responses offered in semistructured interviews and organizational documents served as the tools I used to collect and analyze data for this study.

Credibility. Participants offer the assurance of credibility in qualitative research (Marshall & Rossman, 2016). The primary reason for this assertion lies in that participants are directly involved with the study and the ones who can attest to the legitimacy of the results (Marshall & Rossman, 2016; Wilson, 2015). I was responsible for providing precise, truthful, and accurate depictions of all definitions, information, and data associated with the study. By providing such detail, participants were better able to understand and believe in the credibility of the research and me.

There was no room for error in data collection or data analysis. Omitting attention to detail from research on my part would have negatively influenced the credibility of the study. For this study, I used recorded interviews, aiding in the transcription process. Use of member checking and transcript review helped establish credibility. I conducted a verbatim transcription of the interview responses to reduce the opportunity for errors and misinterpretation of the answers. Each participant conducted a review of the answers at the time of the interview and again after the study was complete to ensure accuracy and credibility. Consistency in processes associated with the data collection on my part ensured the data was reliable. I asked each participant the same questions during the interview and made field notes regarding any pertinent observations.

Researchers use triangulation of the data to assist in establishing credibility in the research (Grossoehme, 2014; Marshall & Rossman, 2016). Four types of triangulation help researchers to improve reliability in research: data triangulation, investigator

triangulation, theory triangulation, and method triangulation (Marshall & Rossman, 2016). For this study, use of several data sources demonstrated methodological triangulation. I used semistructured interviews and organizational documents to collect and analyze the data. The use of various sources (interviews and archival documentation) assured inclusion of a broader lens of views and allowed for a more comprehensive study.

I used member checking during and after the actual interviews to assure dependability in the results of the study allowing for feedback from participants, which further ensured that I interpreted the interview responses correctly. During the interviews, I rephrased questions or offered a summary of the response to ensure accuracy in my understanding and reporting. Once the study was completed, I shared the results with the participants offering an opportunity for their comments and feedback. Credibility in the study occurred once participants had confirmed the accuracy of the results.

Transferability. Transferability in qualitative research refers to the extent to which the results of a study are transferred or generalized across other settings (Marshall & Rossman, 2016). Researchers must be critically descriptive in describing the context and content of the study to ensure the understanding of the facts leading to transferability (Baillie, 2015; Noble & Smith, 2015). Careful and accurate detail to each element of the study on my part ensured more transferability of the research. For this study, creating trustworthiness of the data included a comprehensive examination of the interview transcripts and data, as well as other information and archival documentation. By reviewing the data, I ensured the themes associated with the data analysis demonstrated a

link to other sources and provided a higher probability of transferability to the research. The consistency on my part of each application and process associated with the study also ensured transferability.

The researcher may conduct a member check process with individuals who were not part of the study (Parker, 2014). This process allowed me to determine if the results were biased or nontransferable and if they were similar to the experiences of others. Transferability occurred when the results of this study were consistent and demonstrated replication to produce a similar reliable study.

Confirmability. In this qualitative research study, the findings of the research demonstrated confirmation, support, and substantiation for future readers. I checked and rechecked the data collected ensuring accuracy that led to verification. Participants played a vital role in confirming findings of the research when the evaluation of transcripts occurred. Respondent validation or member checking in this study involved individuals offering feedback at the time of the interview, as well as my repeating and summarizing responses to ensure full understanding. Participant feedback provided accuracy and the appropriate interpretation on my part. My solicitation of participant feedback through member checking upon completion of the study also offered validation. Another strategy that assisted me with confirmability involved having an individual other than a participant to review results to identify and assess any biased or negative information in the study. Individuals not included in the study were asked to review the information presented to help ensure transferability, as well.

Data saturation. Palinkas et al. (2015) described data saturation as the point occurring in research when responses from additional participants offer no new information and responses begin to repeat. The selection of nine individuals accomplished this requirement for this study. When I determined no additional information provided support for the research or when data began to repeat, data saturation occurred. That status indicated that no additional information would be of assistance in the research. If the information provided in interview responses did not begin to repeat, more questions for participants would have been asked until data saturation occurred.

Transition and Summary

The purpose of this study was to explore and understand implementation strategies business leaders in SMEs in the machining industry use to implement technology integration and training. In a competitive business market, business leaders must focus on improving business performance to achieve a competitive advantage (Visnjic et al., 2017). Operational strategies developed by business leaders are crucial for that achievement and must address skill gaps, shortages, and mismatches of employees in the workplace (Visnjic et al., 2017). According to Yin (2018), a case study allows for gaining a better understanding of how prior mechanisms of a situation may not be currently applicable.

In Section 2, I explained the qualitative research method and design, instruments, the role of the researcher, data collection, and data analysis techniques, and reliability and validity. This section also included an overview and detailed information regarding the

selection criteria for the study's participants. Additionally, I explained the development of the interview questions and the process and procedures used to attain reliability and validity of the results of the study. I also provided an explanation of the measures used to ensure the confidentiality and protection of the participants and their responses. Finally, I included detailed information concerning the ethical measures used in the study. In Section 3, I provide the presentation of the findings, benefits to professional practice, implications for social change, recommendations for action and future research, and conclude with a summary of the research, personal reflections, and conclusions.

Section 3: Application to Professional Practice and Implications for Change

The purpose of this qualitative multiple case study was to explore the strategies that SME machining industry business leaders use to implement technology training. The participants in this study included business leaders bearing various job titles, such as owner, plant manager, vice president of technology and training, and president. The participants worked in three SME companies in the Southeastern United States. The key data collection tools for this study included face-to-face, semistructured interviews and organizational documentation review. In this section, I provide an overview of the purpose of the study, state the research question, present the findings, discuss the applications of my research to professional practice, state the implications for social change, offer recommendations for action and further study, provide personal reflections, and state conclusions.

Introduction

The purpose of this qualitative multiple case study was to explore the strategies that SME machining industry business leaders use to implement technology training. The primary data collection instruments for the study were face-to-face, semistructured interviews with open-ended questions and organizational document reviews. Data collected from the interviews and documentation reviews allowed for triangulation. The participants chose the locations, dates, and time for the semistructured interviews for their convenience.

I conducted individual face-to-face semistructured interviews with nine business leaders at three organizations with successful experience in using strategies to implement

technology training effectively. Other sources of data included were internal budget and forecast reports, as well as internal surveys of employee training conducted during the January 2015 through December 2018 period. I assigned individual identifiers to participants that consisted of the letter P and a number for the individual and the letter O and a number for the organization. I assigned the following codes to participants: P1O1, P2O1, P3O1, P4O2, P5O2, P6O2, P7O3, P8O3, and P9O3. Participant criteria for this study included working in a leadership position for a minimum of 5 years in the machining industry to ensure appropriate knowledge and successful experience regarding the phenomenon investigated. Participants must possess adequate knowledge and experience in the phenomenon under investigation to respond to the interview questions (Wilson, 2015). Analysis of the data resulted in three themes, namely strategies for ensuring technology preparedness, strategies for delivering appropriate employee training, and strategies for overcoming barriers to implementation.

Presentation of the Findings

The overarching research question for this study was: What strategies do SME machining industry business leaders use to implement technology training? To answer the overarching research question, I collected data by conducting semistructured interviews with business leaders and reviewing organizational documentation. I triangulated all data collected, which resulted in the emergence of the three themes emerged, which I identify and discuss in the following subsections.

Theme 1: Strategies for Ensuring Technology Preparedness

Ensuring technology preparedness emerged as one of the primary themes from participant responses and review of organizational documentation. All of the participants expressed the importance of conducting copious research and financial analyses to ensure successful implementation of technology. P2O1 reiterated the importance of a systematic approach and identified the following steps to achieve a systematic approach, "(a) analyze if technology is applicable to the company, (b) develop objectives, (c) decide on training avenues, (d) implement the new technology, and (e) evaluate through feedback of the front-end users." In summary, P2O1 gave emphasized the importance of a systematic approach.

P3O1 noted the importance of determining the viable long-term use of the technology and addressing profitability concerns. P3O1 stated,

> Company leaders must determine if the technology is needed to make the company more competitive. Second, is the technology viable long term or will it be obsolete within 5 years? Lastly, what is the total cost and how long will it take to make it profitable.

In addition to research and financial analyses, P2O1 stressed the importance of all members of the leadership team supporting the technology initiative. P8O3 noted that if someone at the top is not on board with the initiative, success of the initiative is imperiled. P8O3 also thought that it was the responsibility of company leaders to ensure that the new technology is effective and accepted among all employees. Implementing new technologies in a company requires change. In some instances, it takes time for that

change to take place (Glenn, 2016). However, it is the full responsibility of company leaders to ensure that changes are effective in order for the company to succeed (Holmberg, 2014).

P5O2 noted the importance of all company leaders supporting the need for new technology and stated that such support can be present in different forms. For example, providing the appropriate training programs ensures that learning and acceptance comes at all levels within the company. Chatzoglou and Chatzoudes (2016) contended that it is the responsibility of organizational leaders to ensure technology integration, learning, and acceptance occurs at each level within the organization. P3O1 viewed accountability as an important component of any technology initiative. P3O1 stated, "our company develops performance measures to ensure that all are meeting specified benchmarks." According to Kim-Soon et al. (2016), successful organizational leaders must provide accountability standards in technology integration efforts. Kim-Soon et al. also concluded that the primary problem with integration often centers on the employees' unfamiliarity with technology, thus creating problems with learning and integration initiatives. Here again, the responsibility falls on company leaders to ensure that adequate provisions for learning, support, and encouragement for all employees are part of the plan, thus ensuring organization-wide technology integration (Kim-Soon et al., 2016).

Kim-Soon et al. (2016) asserted that organizational leaders must ensure that internal processes such as planning, forecasting, and budgeting include a technology component. For this study, evidence was most comprehensive in the documentation for Organization 1, the largest of the three companies in this study with 237 employees. The

company's annual forecasted budget and actual budget forms for 2015, 2016, and 2017 outlined the forecasted expense and allotted funding for both technology purchases and employee training. I found a demonstrated focus on technology and training expenses in the annual budget forms for O2 and O3 for the same period, as well.

Technology planning requires a significant amount of a company's time, fiscal, and physical resources (Choi et al., 2015). Choi et al. (2015) emphasized the importance of company-wide involvement in the planning for technology, primarily to ensure that all employees at each level are working toward the same organizational goals. Konings and Vanormelingen (2015) further asserted that it is imperative for organizational leaders to investigate all competitive advantages and profitability possibilities offered by any new technologies in the company as such planning requires allotting the necessary funding for each initiative. In this study, each of the three organizations allotted funding for technology research to include travel to trade shows, conferences, specific training, among others.

Helu et al. (2015) described the importance of establishing accountability and performance measures to ensure that all employees trained are meeting specified benchmarks. For this study, O1, O2, and O3 provided supporting evidence to demonstrate that their company offered employees technology training and that it provided employees with avenues for feedback concerning the training. Emails, flyers, attendance records, and minutes of meetings documented the explanation of training sessions and the types of training offered. O1 and O2 provided additional documentation of one-on-one meetings with employees explaining the expectations and a follow up meeting with employees to

assess their performance. Additionally, company emails and survey documents provided evidence of training and feedback for future training initiatives at all three companies.

Correlation to the literature. The findings noted in Theme 1 aligned with the findings of several researchers in previous studies. First, Anthony and Patravanich (2014) noted that the actual integration of technology into a company's operations is primarily incumbent upon the company leaders because they are the ones ultimately responsible for developing, nurturing, promoting, and encouraging integration efforts of employees. Furthermore, Konings and Vanormelingen (2015) discovered that leaders who offer a culture that promotes learning and creativity regarding technology integration help produce a stimulating environment in which to work, thus increasing productivity and profitability at the same time.

Other researchers (Hawkins, 2014; Junker & van Dick, 2014; Er & Kim, 2017) suggested that there is a need for additional research to better understand the role that technology leadership positions play in successful integration initiatives and how such positions link directly to profitability of an organization. To successfully integrate technology into organizational practices, supportive and visionary leadership must be present in an organization (Bateh et al., 2014; Donate & de Pablo, 2015; Fichman & Melville, 2014; Wang et al., 2014). The challenge for organizations lies in finding individuals possessing the visionary leadership characteristics to achieve success within the organization (Bateh et al., 2014; Hawkins, 2014; Hernaus & Vokic, 2014).

Correlation to the conceptual framework. Theme 1 relates to Davis et al.'s (1992) TAM framework for employee use and acceptance of technology. Davis et al.

used reasoned action theory to develop the TAM to assess a leader's acceptance and use of technology. The researchers focused on the correlation between an individual's acceptance of technology and the individual's views regarding the use of technology in the workplace. Davis et al. confirmed that beliefs and attitudes about technology influence individuals' behaviors and the development and implementation of strategies and operations of an organization. In this study, the attitudes and beliefs of leaders, such as PU or how leaders view technologies, may benefit production performance. The PEOU or a leader's desire to use and promote technologies that do not require much effort to learn or use was also a consideration for this study (Davis et al., 1992). Davis et al. contended that the use of the TAM might offer an understanding of technology attitudes and help to assess the problem of the lack of a workforce trained in technology. Business leaders must identify and develop strategies to address technology training needs to achieve optimal operations (Thomas, Parsons, & Whitcombe, 2019). Exploring such elements as those included in the TAM in the realm of SMEs in the machining industry offered ideas for development and implementation of successful technology-training strategies.

Theme 2: Strategies for Delivering Appropriate Employee Training

A second theme that emerged from the participant responses and review of organizational documentation centered on the organization delivering the appropriate type of employee training for new technologies. While each participant in this study agreed that the appropriate type of training was vital, the avenues used for training varied. P1O1stated that the company leaders use selective training practices. For example, front-

line supervisors select which employees to train with various technologies. P2O1 and P3O1 stated that their organization often looked to hire employees possessing the specific technology knowledge and training needed before offering them a position with the company. P3O1 stated, "If we hire someone with the technology knowledge, then we have to spend zero dollars and zero time in training them."

P6O2, P7O3, P8O3, and P9O3 stated that each of their organizations outsourced all technology training by sending employees to the local community college or using outside vendors for training. P5O2 stated, "The biggest problem for the company is the time required for training. When employees are being trained, they are not producing." P6O2 stated,

> One of our biggest problems with training is the daily workload and schedule constraints. We probably need to cross-train more. We do try to carve out special time for training; however, that time is often very limited due to the need to repair equipment and meet customer demands.

In addition to the training methods listed above, each of the nine participants stated that their respective organization uses employees to train other employees.

P1O1 works at the largest of the three companies in this study and uses the most technology to train employees. P1O1 stated,

> We use video conferencing, interactive multimedia on our computers, conference calls, interactive videos, web-based training programs, and simulators to conduct some aspects of training. We have several employees who are adept at using technology, and they are eager to see if there are quicker ways to learn a process

> or a new method. Some of them conduct research on their own time to determine if there is a better way of doing things.

P4O2's organization also uses video conferencing, conference calls, and web-based training programs to train employees. P4O2 stated, "We use those technologies provided by some of our vendors to conduct training. We have also used some of those technologies with the local community college in our training programs."

P8O3 works at the smallest organization in this study and has the least amount of technology available for training its workforce. P8O3 stated,

> We have a severe lack of skilled labor in this area when it comes to technology. We also have strict time constraints when it comes to training as production takes priority. We simply do not have the time to adequately learn a lot of new material.

While each organization uses the type of training that leadership deems appropriate for its workforce, participant responses regarding training as an implementation strategy often conflicted with research studies found in the literature. Jimenez et al. (2015) concluded that business leaders must offer many types of technology training at all levels of operations. A review of organizational documents including the web- training schedule for O1, job announcements for O1, O2, and O3, rosters of those employees attending off-site training for O1, O2, and O3 demonstrated the variety of training strategies utilized by the organizations in this study. However, I found a discrepancy in the number of technology training opportunities between the three organizations. The largest company, O1, offered the widest variety of training opportunities, including online and face-to-face training programs. The two smaller

companies, O2 and O3, offered face-to-face group training either at the company site or at a community college or technology provider. The noted discrepancy appeared to be in relation to the size of the organizations. The largest organization had more employees than the two smaller SMEs and also had more people in leadership positions. In addition, the largest organization had the largest annual revenue of the three organizations. By leading the group in size, number of employees, and revenues, O1 demonstrated the most training opportunities, as well as the most varied types of training.

While organizational leaders provide the vision and overall mission for the company, it is crucial for those same leaders to provide learning opportunities for skills-based training for employees (Molinillo & Japutra, 2017). Spanos and Sofos (2015) concluded that a variety of training options are required in the workplace as individuals have different learning styles. For this study, some evidence appeared through the schedule of training opportunities at each of the three organizations. The largest organization (O1) had the most extensive variety of training options. Some of the training sessions at O1 were individualized offering employees a one-on-one approach to training.

Various training opportunities were offered at O2 and O3; however, the variety was somewhat lacking when compared to O1. Most of the training sessions for O2 and O3 were offered in a classroom or group setting. Additionally, O2 has an information technology (IT) team with employees at various levels serving as members. Those employees have input into the types of training offered, as evidenced by the IT team's meeting minutes. This approach is consistent with the findings of Allen and Penuel

(2015) who asserted that employees are often more successful with new technologies if they had input into the development of technology policies and training.

Correlation to the literature. The findings noted in Theme 2 revealed both consistencies and inconsistencies with the findings of several researchers in previous studies. While each of the three organizations in this study has training strategies, the strategies may not be conducive to ensuring that actual training occurs. Donnell and Gettinger (2015) concluded that many of the technology-training strategies used in companies are inadequate. Burgess (2016) further asserted that most training programs in SMEs are too generic to train employees and that internal guidance is often insufficient in providing successful training. Galloway and Lesaux (2014) concluded that business leaders must consider the age, education levels, and learning styles of their workforce before establishing and designing training programs. Generic training strategies and programs do not guarantee successful implementation (Galloway & Lesaux, 2014).

Correlation to the conceptual framework. As with Theme 1, Theme 2 relates to the TAM framework developed by Davis et al. (1992). While Davis et al. focused on the different behaviors associated with technology acceptance, Holmberg (2014) carried that concept through to technology training. There are various stages of change associated with technology acceptance and individuals exhibit different behaviors at each stage (Holmberg, 2014). Klassen and Tze (2014) further asserted that many organizations do not offer their workforce the appropriate technology instruction or training. Perceptions, beliefs, and attitudes of employees determine the success of technology integration and company leaders must ensure that efficient and appropriate training programs are in place

(Ticona, 2015). Fatimah, Putra, and Hasibuan (2016) concluded that leaders must also exhibit positive attitudes and good intentions toward using technology in order for employees to accept the training.

Wu et al. (2015) asserted that learning styles require different application and execution in technology-training programs. The reason behind those differences lies in that individuals learn differently (Wu et al., 2015). The successful application of a variety of training strategies by organizational leaders only serves to benefit employees and the company (Wu et al., 2015; Zheng et al., 2016).

Theme 3: Strategies for Overcoming Barriers to Implementation

Strategies for overcoming barriers to technology implementation was of great concern to each of the nine participants in this study. Each of the nine participants viewed time and money as the two primary barriers. All participants, with the exception of P4O2 and P5O2, also mentioned that with technology-trained employees, another major concern becomes keeping those employees and not allowing the competition to hire them away. P3O1 stated, “they will be picked up by our competitors if we do not treat them well.” P1O1, P2O1, P3O1, P4O2, P5O2, and P6O2 stated that their company pays employees higher wages when new skills are learned. Organizational salary documents for O1 and O2 provided evidence of increased wages after employee training. There was no evidence provided by O3.

Other than those studies centered on the TAM, there is a lack of literature addressing the presence of fear in employees toward technology use in the workplace. Howard et al. (2016) discovered there are differences in opinion among some

organizational leaders and other employees when it comes to technology integration and acceptance. Those researchers concluded that there were divergent opinions among participants on the quantity and quality of technology integrated. Findings from the Howard et al. (2016) study revealed that employee fears were often a barrier preventing full integration as they found that the fear of replacement by technologies served as a repeated response from participants. There were additional obstacles leading to employee fears reported by the participants of the Bennett (2014) study. Those participant responses centered on a limited vision of leadership and adequate time and training opportunities as primary barriers, which led to employee fears (Bennett, 2014).

For this study, all nine participants mentioned employee fears as another major barrier to technology training. This may be encouraging, as organizational leaders in past studies had not considered employee fears as a barrier. P2O1 stated, "it is critical for us to assess an accurate and reasonable timeline for implementing new technologies." P5O2 stated, "we should never implement any technology faster than the employees are able to learn." P1O1, P2O1, P3O1, P4O2, P5O2, P6O2, and P7O3 mentioned that having the appropriate equipment and resources in place is crucial. P3O1 viewed technology planning and allocation of resources as key to ensuring successful technology integration. Another barrier mentioned by P1O1, P2O1, P3O1, P4O2, P5O2, P6O2, and P7O3 included the time constraints associated with training.

P1O1 asserted that technology training can be stressful and it takes much effort. P2O1 agreed and stated,

> Training for new technologies affects current production and it affects the bottom line. It also affects employee attitudes. Managers are not always happy being understaffed as employees who are away for training are not producing. In addition, front line employees are often fearful of attempting to learn a new technology for fear of failure.

P7O3 stated, "some of our employees are afraid of losing their jobs if they do not do well in training. We must do a better job of reassuring them and encouraging them in training." P9O3 noted that many employees do not possess the basic technology knowledge to maneuver technology in the workplace. P9O3 stated, "many of our employees lack technical skills. A lot of them do not have Internet at home and do not use email or other basic technologies." P8O3 agreed and stated,

> This is a rural area and high-speed Internet is not always available. Those who want to use the Internet at home get very frustrated. For those employees who do have a basic knowledge of technology, frustrations occur when they think technology is changing too fast for them to keep up. P2O1 noted that there are always skeptical employees when a new initiative is considered.

P2O1 stated,

> We have some employees who are always against any kind of change. However, we also have many employees who are willing to make things better. The basic problem comes when we do not educate our workforce as

> to how beneficial a new technology can be to our company. We always try to help employees understand how the technology will make production better overall and make us a more efficient company. And, of course, we always award a pay increase for the new skills once performance is consistently good.

P3O1 concurred with the view of P2O1 and stated, "we try to explain how the new technology is compatible with our operation and process. We also attempt to help employees understand how the new process can make each of their jobs run more efficiently."

As Tondeur et al. (2017) demonstrated funding is a critical part of strategy development for technology integration in both public and private sector organizations. All nine participants agreed that money is the primary consideration when considering adding new technologies. P7O3 stated, "lack of money is our biggest challenge. We have to be sure that the allocation of each dollar is going to provide the best return." P8O3 stated, "Prior to developing strategies concerning funding, we have to look at the overall vision of our company and determine if the new technology is going to help us achieve it." P1O1 stated,

> Our strategy when considering funding for a new technology is to assess the entire process from beginning to end before implementation. We review the cost of the technology and the cost and time required for training that are required for us to get the most for our money.

P5O2 stated, “we must make sure there are enough employees to ensure successful implementation of the new technology. We must also consider how long the training will take and how it will affect current production timelines.” There is a plethora of evidence in the literature to support the need for ample funding when developing strategies for any type of technology training. However, as Dong et al. (2017) found, there is little information present about how to include funding for increasing employee wages after training is completed. Dong et al. (2017 recommended organizational leaders review the literature concerning motivation and incentives for ideas on how to maintain a technology trained workforce.

Correlation to the literature. The findings in this study correlate to the findings of other research studies. SMEs are the engine of growth due to their major impact on a country’s economy (Putra & Hasibuan, 2015). Putra and Hasibuan (2015) contended that SMEs could improve their efficiency and competitiveness through adoption of new technologies. However, compared to larger organizations, SME’s rates of technology adoption are low (Fatimah et al., 2016). Tondeur et al. (2017) asserted that technology strategy development must become a significant component of an organization’s strategic processes and operations. While implementation of technology strategies is a stressful undertaking, it is also incumbent upon business leaders to demonstrate excitement, encouragement, and passion regarding technology initiatives to motivate and engage all employees in learning (Scherer et al., 2015).

Company leaders must also ensure that employees accurately match their job duties to ensure appropriate alignment with learning new technologies (Putra &

Hasibuan, 2015; Rienties et al., 2016). Hauge (2014) discovered that many organizations had technology equipment and resources in place within the organization; yet, those technologies often sat idle, as a lack of strategies prevented implementation of the technology. Howard et al. (2016) concluded that employees' fear of being replaced by technologies served as a repeated response from front line employees. In addition, Bennett (2014) found that many front-line employees reported a limited vision of leadership and adequate time and training opportunities as primary barriers to technology use in the workplace.

Correlation to the conceptual framework. One of the largest barriers to technology training is an individual's acceptance or rejection of a technology and its use (Erasmus et al., 2015). Researchers have discovered evidence of such resistance through the lack of technology integration and acceptance permeating entire educational systems, businesses, and organizations throughout the country (Adams et al., 2016; Jimenez et al., 2015; Mintz & Tal, 2014). Theme 3 relates directly to the TAM framework developed by Davis et al. (1992), as it highlights the presence of employee fears in technology training in the workplace.

By learning the basic concepts of the TAM, business leaders are better prepared to develop implementation strategies and make decisions about what types of training to offer their workforce (Yoon, 2016). Hauge (2014) contended that the perceptions, beliefs, and attitudes of business leaders determine the quantity and quality of technology integration into an organization (Abdullah et al., 2016). Employee fears are a primary barrier in establishing an organizational culture and affect technology-training initiatives

at various levels (Whitehead, 2015). Fatimah et al. (2016) asserted that current technology knowledge and attitude toward technology might hamper any technology integration strategy. Companies should also note that employees learning, training, and obtaining higher levels of skills become a vital asset to the organization (Fatimah et al., 2016).

Whitehead (2015) asserted that the development of more encompassing technology strategies inclusive of all affected employees provides an avenue for the removal of employee fears. Technology integration plans must permeate the entire organization (Whitehead, 2015). For successful technology integration in American organizations to occur, organizational leaders must be comfortable in exploring and executing new methodologies for training (Jimenez et al., 2015). Supportive and encouraging leaders also help alleviate fears of subordinates (Donate & de Pablo, 2015; Jimenez et al., 2015). Furthermore, Fatimah et al. (2016) concluded that the president or chief executive officer of an organization must possess traits conducive to technology integration and training. Such traits include extraversion, openness, and passion about technology usage in the workplace (Fatimah et al., 2016).

Application to Professional Practice

The purpose of this qualitative multiple case study was to explore the strategies that SME machining industry business leaders use to implement technology training in the Southeastern United States. I collected data from conducting semistructured interviews with nine participants and reviewing internal organizational documents. After analyzing the data collected, I found a similar level of preparedness, funding, and training

required to equip a workforce with the appropriate technology knowledge. Participant responses concerning strategies that were crucial to integration of new technologies into an organization's current operations aligned with researchers' affirmations found in the literature review in that adding new technologies into a company requires considerable planning to include resource allocation and positive beliefs and attitudes of organizational leaders, as concluded by Dong et al. (2017).

This study's participants offered ideas and practices that afford other organizations the opportunity to duplicate implementation strategies centered on acceptance, readiness, and removal of barriers in technology integration into the workplace. The findings of this study are also important in showing business leaders the importance of examining current strategies used to ensure technology preparedness, evaluate employee training, allocate resources, and alleviate some of the disruptions that barriers to implementation cause. There are still organizations that lack effective training programs, despite the presence of technology in the machining industry for several decades. Organizational leaders could use the findings from this study as a guide to producing better accountability and evaluation systems aimed at providing a more knowledgeable workforce. I also found that organizations should ensure effective planning and resource allocation, as both are crucial to successful technology integration and training.

P1O1, P2O1, P3O1, P4O2, P5O2, and P6O3 reiterated the point that a company's leaders play an integral role in setting the tone, culture, and structure for technology training. P2O1 stated that all organizational leaders must be in agreement when

developing internal processes and procedures to ensure technology acceptance and integration into the company occur. P1O1 suggested that an accountability and evaluation system be included in any training initiative to receive first-hand feedback from those involved in the training. P1O1 further suggested that employees at all levels be involved in technology planning to ensure buy-in. P2O3 explained the importance for a company's leaders to be in agreement with technology initiatives. P2O3 stated, "there will be no success with the project if leaders exhibit poor attitudes and behaviors demonstrated through ill-fitting policies and procedures." The suggestions and ideas concerning the culture and tone set by a company's leaders align with Donate and de Pablo (2015) who concluded that supportive and visionary leadership must be present in any organization focused on technology integration.

Findings from this study also show the need for training programs designed to ensure better delivery and success. All participants agreed that many times in the past, training programs consisted of only information for employees on new processes and procedures. However, P1O1 stated that O1 offered customized training for specific new technologies and found that method was more conducive to learning for the company's employees. All participants also noted the primary barrier to technology training was lack of time. P2O1 stated that each company should allow the necessary time for comprehensive technology training or it may very well be wasting valuable time. Findings from this study support the need for comprehensive technology training to ensure that company processes and operations improve. Previous studies support the recommendation for companies to provide adequate and useful training programs

(Donnell & Gettinger, 2015; Schrum & Levin, 2016). Schrum and Levin (2016) offered helpful information concerning the integration of technology centered on training, mandated assessments, contact time of use of technologies, and the creation of avenues of communications for employees regarding technology. With the lack of technology knowledge, many SMEs are becoming stagnant or falling further behind in technological innovations. With the fast pace of conducting business and the latest technology innovations, business leaders are finding themselves in an environment requiring quick modification of machining processes. Those quick modifications are causing companies to struggle to compete, especially the smaller SMEs (Brunswicker & Vanhaverbeke, 2015).

Implications for Social Change

Nolan and Garavan (2016) demonstrated that there is a lack of technology knowledge in the workforce. The problems exist not only with the unskilled workforce, but also with those desiring to enter the workforce. Many job seekers are simply technologically unprepared to enter the workforce (Nolan & Garavan, 2016). Business leaders must first ensure that any current technology implementation strategies do not hinder or delay implementation of new technologies within the company. Organizational leaders must also create an environment that encourages employees to broaden their technology skill level. All technology implementation strategies must result in achievement of operational objectives and ensure that the company remains viable in their particular industry (Dong et al., 2017).

Findings from this study support the benefits of increased technology-skill levels of employees through comprehensive technology training. According to Molinillo and Japutra (2017), the skill sets and knowledge required today are much different from any other time in history. Both cognitive and technology skills are required of employees to ensure incorporation of new technologies into company processes and operations (Molinillo & Japutra, 2017). The same technological advances of this century that have benefited workplace procedures and production have created somewhat of a skill bias when it comes to technology acceptance and integration into a company. Organizational leaders must focus on increasing both cognitive and technology skills of its workforce to ensure that the entire organization achieves optimum efficiency and a competitive advantage (Molinillo & Japutra, 2017). While increasing cognitive and technology skills of the workforce could benefit organizations nationwide, it may also offer employees a sense of accomplishment when learning new skills. Those new skills may also provide for an increase in salary or new job opportunities for the individual. Such achievements mean that workers may be better able to provide for their families and perhaps increase the family's quality of life.

Recommendations for Action

For this study, I reviewed responses from participant interviews and organizational documents. I identified various themes regarding technology implementation strategies considered relevant for organizations to integrate technology in the workplace. The primary themes were ensuring technology preparedness, delivering appropriate employee training, and overcoming barriers to implementation. My analysis

of those three themes aligns with recommendations and findings of previous researchers that may provide business leaders with suggestions for successful technology integration that assist in minimizing barriers to such efforts (Abdullah et al., 2016; Baard et al., 2014; Brunswicker & Vanhaverbeke, 2015). Successful technology integration requires that company leaders invest the necessary effort and resources. Based on the findings from this study, I offer several recommendations that might assist business leaders in developing comprehensive implementation strategies focused on successful technology integration into the workplace.

First, company leadership must ensure that all of their business leaders are equipped to lead technology integration efforts. This goal requires that leaders demonstrate excitement, encouragement, and passion to motivate and encourage employees to learn (Tondeur et al., 2017). As a company's leaders are the primary change agents within an organization, this requirement is necessary. Company leaders should also consider a team approach when developing such strategies. Such a team should include employees at all levels of the organization to ensure that technology strategies are comprehensive and broad-based. Including employees at various levels in the development of strategies ensures the rates of buy-in and opportunities for success are greater. Company leaders must provide the necessary leadership skills to ensure that all employees are aware of how the new technology will benefit the organization. If employees feel the new processes are more of a hindrance, they will be less like to become enthusiastic about implementation.

Business leaders should also review and adopt the premises of the conceptual framework for this study. Business leaders could use the TAM to gain an understanding of the benefits associated with removing resistance to technology implementation (Davis et al., 1992). The central constructs of the TAM also offer avenues for leaders to understand the intention of employees to use technology (Yoon, 2016). Those constructs are subject norm (SN), perceived usefulness (PU), perceived ease of use (PEoU), behavioral intention (IU), attitude toward use (ATU), and actual use/usage (AU). Once leaders understand the reasons employees accept or reject technology and its use, leaders are better equipped to lead any new technology implementation strategy. This necessary step on the part of company leaders will ensure both organizational and individual efficiency for the company.

Next, organization leaders should ensure that the employee training programs offered are appropriate for their workforce. The fundamental beliefs and perceptions of organizational leaders about technology affect operational processes and procedures, including training. There are different stages of change regarding technology acceptance, and individuals exhibit different behaviors at each stage (Holmberg, 2014). Therefore, business leaders must offer the appropriate technology instruction or training for their workforce. In the past, such programs had a lack of flexibility and attention to individual needs (Klassen & Tze, 2014).

While some employees may accept technology rather quickly, others may feel intimidated by it. Thus, business leaders should allocate adequate time to ensure that all employees understand how the technology benefits the company and the employees.

Rather than offering a one-time trip to the community college for learning a new technology, perhaps leaders should spend time creating awareness and acceptance prior to any type of training. Company leaders should create training programs offered in a variety of formats. People learn differently. While some are hands-on learners, others are visual learners. Training programs designed to include a variety of avenues for employees to learn are often most successful.

One essential component of any training program is evaluation. Employees afforded the opportunity to honestly evaluate a program are more apt to be open to future training of other technologies (Spanos & Sofos, 2015). Company leaders developing non-generic training programs demonstrate a component of visionary leadership. Such leaders usually provide all of the tools, elements, and support employees need to learn a technology. Those same visionary leaders do not offer bland training programs that often only inform employees of new policies, regulations, and guidelines related to technology (Huang & Chiu, 2015). Innovative leaders develop and offer customized training within an appropriate setting that is conducive to learning (Huang & Chiu, 2015). Company leaders offering these types of training opportunities provide an environment that fosters an increased technology implementation within the workplace.

A final recommendation centers on company leaders limiting the impact of different barriers to technology implementation. Rienties et al. (2016) found that there are many indirect obstacles to technology implementation, such as poor soft skills. For instance, poor time management and matching of employees with job duties. Beneficial actions on the part of company leaders may provide adequate time and technical support

for employees learning new technologies, ensuring that the employees accurately match their respective jobs.

The leaders must also create efficient technology implementation strategies that build upon each other. Providing the necessary, adequate, and reliable equipment is essential to success. Quintana and Zambrano (2014) found that inappropriate software and hardware was the primary reason employees reported as reasons for the lack of technology integration. A major building block required for technology implementation centers on employees understanding how the new technology affects them individually. Thus, business leaders must ensure that employees know how the new initiative will affect the company and the employee.

The most disturbing barrier to technology implementation is often poor leadership and lack of visionary leadership regarding technology strategy development (Donate & de Pablo, 2015). Companies cannot expect employees to successfully accept and learn new technologies if the leaders do not possess a vision for the organization's direction. Organizations must ensure that they have the right leaders in place to achieve optimal efficiency in operations and to help achieve a competitive advantage in the industry. Ignoring a barrier may impede any success with various other company strategies.

Findings and recommendations from this study directly influence the efforts of SMEs in the machining industry to offer an optimal efficient workplace. I will use a variety of avenues for distributing the findings to business leaders in area machining organizations and training providers, such as the community college. Publication of this study in the ProQuest/UMI database ensures broad access to students and other

researchers on the topic. Each of the nine participants in this study will receive a one-to-two-page summary of the findings and recommendations. I hope to present the findings at the state level for community colleges to encourage machining instructors across the state to ensure technology is included in every aspect possible of their instructional courses.

Recommendations for Future Research

For this study, I used a sample of participants from area manufacturing businesses in the machining industry. I analyzed company documents looking for processes and procedures to determine how each implements technology strategies for training employees. Through the responses of participant semistructured interviews and the review of documents and relevant literature, I discovered strategies that may prove useful to other business leaders for effective technology integration. However, there are limitations to the study that may lead to future research.

The first recommendation is to conduct a similar study with larger metropolitan organizations that could provide additional information useful for SME business leaders in technology training for employees. One limitation of the study was that it included organizations in a small, rural area of North Carolina. The study findings may be limited in that they reflect a small population of the machining industry. The second recommendation is to conduct a similar research study using the quantitative research method. Examining the amount of money spent on technology and technology training may serve to assist business leaders in reaching more accurate budgeting and forecasting for such initiatives, as that information influences the development of specific implementation strategies. The third recommendation for future researchers is to

interview front-line employees, as opposed to business leaders. Employees actively engaged in the day-to-day production may offer beneficial information for business leaders to use in technology planning and integration, leading to optimal efficiency and a competitive advantage. The fourth recommendation is for researchers to conduct follow-up interviews to discover additional relevant information to assist business leaders in developing implementation strategies (Er & Kim, 2017). Participant interview responses may be indicative of the mood of the participant at the time of the interview. Researchers may discover that a different response may surface at a different time (Er & Kim, 2017). Finally, future researchers may consider interviewing business leaders immediately following an implementation effort. Here again, the timing of the interview may affect interview responses, particularly concerning any barriers influencing the implementation and the way leaders overcame such barriers.

Reflections

The machining industry consists of many SMEs that are often limited in resources. While this is true, one of my preconceived notions was that hardly any local area SMEs had a fully staffed IT department or group of IT employees performing technology-related duties and developing technology strategies. In those cases, it becomes crucial for SME leaders to utilize external avenues to implement new technologies as well as training programs (Putra & Hasibuan, 2015). Using a variety of avenues for technology implementation will increase the likelihood of successful programs. Such is the case for this study. Many local SME business leaders are currently using a variety of tools for technology training in their companies.

One of my goals for conducting this multiple case study was to explore a topic of interest with implications for building a higher-skilled workforce in this rural area. Through interviews with the participants, I conducted an investigation of strategies used in technology integration into SMEs. While I did possess some personal biases and preconceived notions on the topic, I remained cognizant of not injecting my opinions and continued to focus on collecting the pure data. After data collection, I maintained that stance while analyzing and interpreting the data and documenting the results of the study.

Another preconceived notion of mine centered-on employees being resistant to change. However, I quickly learned during interviews that if business leaders believe that new technologies may enhance their operations and help create a competitive advantage, they are more receptive to change. Those observations and participant attitudes regarding technology are in line with previous studies. Hauge (2014) discovered that values and technology acceptance of organizational leaders directly affected the type and amount of technology accepted by lower level employees. Hauge further concluded that the quantity and quality of technology integration into an organization centered, in part, on the perceptions, beliefs, and attitudes of company leaders.

The participants in this study appeared to offer candid and honest information in the interview responses. Through those responses, participants offered information that confirmed the findings in previous studies regarding the many barriers associated with technology training. In addition, participants provided information based on the TAM regarding the acceptance and use of technology by different individuals in the workforce. For the data analysis portion of this study, I used participant responses, document review,

and literature review to determine various strategies for overcoming barriers to technology training in SMEs.

Conclusions

SMEs are at a disadvantage when it comes to technology integration and training. The lack of multiple or adequate resources cause limited adoption and acceptance when compared to larger enterprises (Ababneh, Shrafat, & Zeglat, 2017). One misstep in implementation strategies may cause devastation to an SME. The literature is lacking when it comes to specific guides for SMEs and technology integration. The findings of this study may offer ideas and suggestions for SMEs desiring to implement more technologies into their organizations.

I offer some ideas and guidelines for overcoming many of the barriers associated with technology integration and training. This study's findings resulted from information I gathered from interview responses of nine participants in three SMEs in the Southeastern United States. I used those responses, along with organizational document reviews, observations, and information found in previous studies to explore technology implementation strategies used by business leaders in the machining industry. Using a multiple case study allowed me to explore the phenomenon of technology integration at three different-sized organizations. Using multiple data collection instruments, identifying personal biases, and conducting member checking give credibility to the findings of this study.

Technology integration into an organization affects all basic operation systems for SMEs. Such an undertaking requires a collaboration of combined effort on the part of

business leaders and all employees alike. Central to this process is an assessment of the company's current standing in an industry and where it desires to go. This assessment includes a comprehensive evaluation of operational, financial, and human resources prior to implementation. Additionally, business leaders must assess the level of acceptance by its workforce and explore avenues to enhance or improve such acceptance. It is hopeful that recommendations from this study may enable business leaders to develop comprehensive implementation strategies that empower each employee to embrace technology in the workplace.

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Appendix: Interview Protocol

Thank you for your consent and assistance with this research. I am recording this interview to ensure that I collect all of the information that you provide. First, I would like to remind you of the primary purpose of my study. Technology training in the machining industry is a matter that continues to be problematic for some companies. This study is an exploration of how business leaders may achieve successful solutions to the issue and continue to achieve the organizational mission. Responses to the interview questions will assist me in addressing my research question, "What strategies do SME machining industry business leaders use to implement technology training?"

This interview will last approximately 1 hour. Do you have any questions before I begin to ask the interview questions?

Interview Questions

1. What technologies are currently in use within your organization?
2. What are the primary steps you use within your strategy implementation for technology training within your organization?
3. What are some of the barriers that you have encountered during implementation of technology-training strategies within your organization?
4. How did you address or overcome identified barriers to technology training?
5. What benefits has your company realized from any prior implementation of strategies for technology training?

6. What experiences can you share regarding implementation of technology-training strategies?
7. Is there any additional information that you wish to provide concerning technology implementation strategies used within your company?

I appreciate the time and expertise that you have offered for my research. During the next two weeks, I will review and write up a summary of the interview based on your responses. I will email the transcript to you for approval or suggestions for revisions.

There will be no reference to your name or your organization in the research as noted in the consent form. All information that you have provided will be password protected and locked in a fireproof file cabinet for 5 years. I am the only individual with access to that information. After 5 years, I will destroy all data relating to the research.