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An Aging Workforce and the Technology Gap: An Exploratory Multiple Case Study

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Abstract

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MA, Troy University, 2012

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Dissertation Submitted in Partial Fulfillment

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Abstract

A gap exists in the literature on the actual experiences of older workers with information and communication technology adoption in technology-infused workplaces. To inform organizations on how to more effectively support this employee group's adoption of technology, the purpose of this qualitative exploratory multiple case study was designed to gain a deeper understanding of the daily experiences of older workers when adopting and adapting to information and communication technologies in a technology-infused workplace. This study is framed by, first, the *selection-optimization-compensation framework for successful aging* and, second, the *age-inclusive training design framework.* Semistructured interviews with 8 participants, observational field notes, and archival data provided data regarding specific technology experiences among older workers in the workplace. Identifiable themes emerged through thematic analysis of the textual data and cross-case synthesis analysis. A total of 8 categories that enclose a total of 18 themes were identified. The categories are (a) selection of resources, (b) optimization of resources, (c) compensation of resources, (d) performance limitations, (e) assessing training needs, (f) establishing/ sustaining performance, (g) age-inclusive training needs, and (h) older workers as organizational assets. Findings enhanced social change efforts by providing insight on the daily experiences that the older worker faced which may contribute to limited productivity in the workplace. Organizational leaders and human resource managers may use results of this study to implement provisions that improve help organizational profitability, team cohesiveness, and workplace satisfaction.

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Chapter 1: Introduction to the Study

As the workforce continues to age, tremendous changes are taking place in the work environment and organizational structure (Bazley & Brooks, 2013; Colbert, Yee, & George, 2016; Taneva, Arnold, & Zacher, 2018). Four generations are working together simultaneously in the workforce, each with their unique method of learning, communication, and relationship styles (Barrios & Reyes, 2015). Although beneficial, modern information communication technology (ICT) has created challenges in the workforce for the aging worker (Van Yperen & Wörtler, 2016). The workplace has been transformed into a technological center where individuals must remain abreast and consistent with changes in technology to remain relevant as an employee. Older workers, defined as those 60 years of age or older (Tams & Hill, 2017), often perceive the changing nature of work with trepidation, fearing job polarization and job loss (Ng & Law, 2014; Peng, Anwar, & Kang, 2017).

According to the Bureau of Labor Statistics (BLS, 2016a) the United States labor force increased by 8.5% during the period 2006–2016, and today five generations coexist in work environments supported by ever-evolving technological advancements (Haeger & Lingham, 2014). The BLS (2016b) indicated that workers age 65 and over account for 6.1% of the total labor force and the proportion of workers over the age of 55 continues to grow—and at a far faster rate than those in the 25–54-year-old age group. Employers and organizations need to prepare to revise current human resource (HR) and training practices related to developing technological transformations, with renewed mindsets and policies addressing the presence of a growing older workforce (Damman, 2016). By

developing a new logic and practices, organizations can retain the older workers needed to meet modern and global business challenges. To reach this goal, organizations need to design uniform policies that are not limited by age and inclusive of older workers in the 21st century (Moen, Kojola, & Schaefers, 2016; Silver & Williams, 2016).

This chapter provides insight on the challenges faced by older workers with ICT adoption in technology-infused workplaces. First, I present the background information and in the presentation of the problem includes a description of the gap in the scholarly literature knowledge. Following is a presentation of a logical alignment between the problem, purpose, research question, and conceptual framework of the study. Finally, this chapter presents the significance, assumptions, and limitations of the study, and definition of key terms used throughout this document.

Background of the Study

Due to the age-related transformation of the labor market taking place simultaneously with the rapid growth of a global digital workforce, little information is available in the extant literature on how organizational work practices support older workers to leverage ICT in the workplace (McCausland et al., 2015). More specifically, there is a dearth of literature on the specific challenges older employees face with ever-evolving ICT in the workplace (Tams & Hill, 2017). Technology has had various impacts on each generation, including differing engagement levels of technology and influencing job satisfaction and retention of multiple generations now finding themselves in the same workplace (Abu-Elhassan, Elsayed, & Soliman, 2016).

Five generations are currently coexisting in the work environment and researchers have noted various employee outcomes within today's cross-generational diverse workplace (Carmichael, Hulme, Porcellato, Ingham, & Prashar, 2011). Seventy-five percent of this workforce is at least 60 years or older (Barrett & Bourke, 2013). For example, younger workers, who are deemed as technically literate employees, faced difficulty with having their job expectations met, causing a retention problem for the employer. Scholars predicted that older workers in an aging workforce would be more likely to cope and meet such job demands in contrast to their younger coworkers (Guglielmi et al., 2016).

In research indicating a rival interpretation of Guglielmi et al.'s (2016), the technical competency of the worker should not be warranted based on age, as this can create dangerous assumptions in the workplace amongst workers. In other more recent research, older workers experience major problems using modern technologies, causing greater anxiety and stress, leading to problematic results (Tams & Hill, 2017). Different findings, however, have also been presented. Zimmer, Tams, Craig, Thatcher, and Pak (2015), who examined the actual user component that may contribute to ICT use error, found that age is not a determining factor, as assumed, when mistakes are being made in a technology-enabled context.

Older workers are a valuable resource, and many tools can aid in managing them efficiently (Taneva et al., 2018; Zimmer et al., 2015). Innovative human resources development (HRD) solutions may be key to guarding against someone becoming a replaceable employee in today's technology-infused workplace (Zwick, 2015). For

example, wearable technology, or devices that can be worn by a consumer and often include tracking information related to health and fitness, could contribute to a new means for employers to tackle the challenges that are associated with an aging workforce. Wearable technology could create a wide spectrum of opportunities to sustain and extend working lives by keeping aging workers safe and healthy through prevention (Lavallière, Burstein, Arezes, & Coughlin, 2016). Another study concluded that when older employees perceived higher levels of useful feedback from their coworkers, the gap between age and technically innovative behavior in the workplace is lessened (Schaffer, Kearney, Voelpel, & Koester, 2012).

Research gaps remain on whether and why training of older employees might be less effective than training of younger employees (Zwick, 2015). Some results in the extant literature reveal that training of older employees may increase the relative productivity of older employees (Göbel & Zwick, 2013) or that the performance of older workers in training programs is lower (Ng & Feldman, 2012). Relatively well researched is the rationale for lower effectiveness from the training supply side of older workers (Taylor, Rolland, & Zhou, 2017). HR managers frequently seem to believe older employees are less able or willing to learn, and, mainly due to a lack of data, not much is known about the training demand side or the opinion of older trained participants (Zwick, 2015).

Problem Statement

The general problem is that many older workers in today's digital workforce may experience a generational technology gap limiting their productivity in technology-

infused workplaces, where ICT is spread and applied throughout all levels of an organization (Barrett & Bourke, 2013; Guglielmi et al., 2016; Taneva et al., 2018). Data from the BLS (2016a) projected the labor force to increase by 8.5% during the period 2006–2016; however, when dissected by the different age categories, differences emerged. Currently, there is a coexistence of five generations in the work environment that utilizes advancements in both work and life (Becker, Fleming, & Keijsers, 2012; Haeger & Lingham, 2014). The BLS (2016b) indicated that workers aged 65 and over account for 6.1% of the total labor force. It also stated that the number of workers in the youngest group, ages 16–24, is expected to decline during 2006–2016 and workers age 25–54 will slightly rise. Consequently, scholars predict an inverted population pyramid for 2050 (Gonzalez & Morer, 2016). The proportion varies from one country to another: more than 23% of the population will be over 65 in Japan and in the U.S., and 17.9% of the population will be over 65 in Europe (Central Intelligence Agency, 2015). Due to the age-related transformation of the labor market taking place simultaneously with the rapid growth of a global digital workforce, how older workers leverage ICT in the workplace potentially may create collisions between generations (Haeger & Lingham, 2014; McCausland et al., 2015; Taylor et al., 2017).

Little is known about the specific challenges the Boomer cohort of employees faces with ever-evolving ICT in the workplace (Tams & Hill, 2017). Scholars investigated the association of age with lower productivity using ICT with mixed results (Löckenhoff, 2011; Zimmer et al., 2015). The large Boomer cohort, who are identified as those born in the United States from 1946 through 1964, is growing older, and with an

extended life expectancy continues to leave organizations with a historically unprecedented older workforce (Moen et al., 2016). Nevertheless, the aging workforce poses a challenge for technology-infused workplaces and their HRD must now focus on strategies to capitalize on the rising availability of older workers in the 21st century digital workforce (Moen et al., 2016; Young, 2013). The specific problem is organizations need an in-depth understanding of older workers' experiences with ICT adoption in technology-infused workplaces to develop training protocols aimed at addressing technology barriers to productivity associated with the graying national workforce (Behaghel, Caroli, & Roger, 2014; Tams, 2017; Taylor et al., 2017; Zimmer et al., 2015). A gap exists in the literature on the actual experiences of older workers with ICT adoption in technology-infused workplaces to inform organizations on how to more effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017; Taneva et al., 2018).

Purpose of the Study

The purpose of this qualitative exploratory multiple case study was to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. Meeting the purpose of this study may inform organizations on developing training protocols aimed at addressing technology barriers to productivity associated with the maturing national workforce and supporting this employee demographic group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017). To address this gap, I used the qualitative paradigm and an exploratory, multiple-case research methodology to address

the research problem. Information from semistructured interviews conducted via social networking media such as Skype and FaceTime, observational field notes, and archival data were collected through multiple sources to obtain data regarding the specific technology knowledge gaps among older workers in the workplace (see Yin, 2017). Triangulation of data sources was utilized to establish credibility of the researcher's analysis and findings on the phenomena under study (Guion, Diehl, & McDonald, 2011).

Research Question

To obtain the appropriate answers in a research study, the right questions needed to be asked (Browne & Keeley, 2007). In line with the purpose of this study, the study's central research question (CRQ) is as follows:

CRQ: What are the daily experiences of older workers with ICT adoption in technology-infused workplaces?

Conceptual Framework

This study is framed by, first, the *selection-optimization-compensation framework for successful aging* (Baltes & Baltes, 1990), which "builds on the assumption that individuals encounter certain opportunities as well as limitations in resources which require them to make choices regarding the allocation of those resources" (Ng & Law, 2014, p. 3), and, second, the *age-inclusive training design framework* (Williams van Rooij, 2012), which indicates that critical to the design process of HR training driving aging workers' improved performance and productivity is a solid understanding of the learner's work experiences with emerging technology.

The selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990) was first developed through Baltes and Baltes' seminal research on the psychology of aging focused on how individuals manage their lives in a manner that promotes their well-being and personal development (Baltes & Baltes, 1990; Baltes & Dickson, 2001; Freund & Baltes, 1998), as well as through the work of Hobfoll (1989, 2002) on the conservation of resources to aid in explaining how individuals deal with declining resources as they age. Baltes and Baltes (1990) suggested that individuals adapt successfully to the loss of resources by adjustments in their use and allocation, which the authors referred to as selection, optimization, and compensation (SOC).

To help organizations incorporate instructional design and systematic design models (Rothwell & Kazanas, 2008) in their training, the age-inclusive training design framework (Williams van Rooij, 2012) guides by a process and principles centered on establishing and sustaining performance that is both effective and efficient. Analyzing the target audience, as well as the context and content of the training, is crucial for assessing training needs (Taneva, Arnold, & Nicolson, 2016). The performance problem that needs to be solved must be identified and a decision made as to whether the solution involves training. Termed *audience analysis* by Williams van Rooji (2012), this front-end analysis is not time intensive and, when training is deemed the appropriate solution, it will justify the resources needed to carry out a comprehensive training needs assessment (Rossett, 2009). Audience analysis requires collecting data on pertinent characteristics, for example gender, age, education, job performance, job satisfaction, prior training, skills needed for the training, learning style, language, cultural differences, and training

motivation (Williams van Rooji, 2012). The analysis of these data can be used to guide the selection of instructional strategies and supporting activities, materials, and technologies. Further, audience analysis helps a designer to create a more comfortable learning environment for trainees, thus motivating them and paving the way for more effective training outcomes overall (Lam & Hannah, 2016).

There are common themes and findings to be found in conceptual studies that offer recommendations on what practices to adopt when developing age-inclusive training. It is increasingly recognized that the design of age-inclusive training falls within a larger context when examining organizational approaches to talent management (Krishnan & Scullion, 2016). Ongoing efforts to improve actions in this and related areas will enable HR professionals to develop and implement effective strategies for managing an organization's talent in a workforce that is today more multigenerational than ever (Alcover, 2017).

Nature of the Study

The nature of this study is qualitative so that the method aligns with the purpose of the study and provides data for the research question as I looked deeper into a growing problem with older workers and technology usage by understanding their views and perceptions. Given that the study's purpose calls for a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces, an exploratory multiple case study (Yin, 2017) was used to meet the study goals. The goal of qualitative research is to explore experiences from the vantage point of people living within a specific context; this method is associated with the constructivist paradigm

(Cooper & White, 2012). Qualitative research highlights the different vantage points of people in a context which explores the world through a limited scope and it is linked with the interpretivist paradigm (Cooper & White, 2012). The communication that develops between researcher and participants who use an in-depth interview method of qualitative research approach can generate modern meanings throughout a given social context (citation). From a historical perspective, qualitative research methodologies for the interpretivist paradigm were originally developed to give a voice to a society's victims of dominant institutions, organizations, and social groups for the purpose of social change (Cooper & White, 2012).

A multiple case study investigating a social phenomenon can involve individuals living within a specific social context as a separate unit of study (Yin, 2017). Multiple case studies are set apart from, for example, surveying several persons about something in lieu of one, or, broadening the number of subjects within an experiment. Instead, when using multiple cases it should reflect the replication of a study or an experiment (Yin, 2017). Resulting in the conclusions that are yielded from one case should be set side by side and contrasted with the results from the other case(s). The number of cases that are needed to be performed to boost the sample and expand the statistical strength would require more cases than what is probably allowed or even accessible. Alternately, the multiple case study and the selection of the cases are categorized into two types of selection. The *literal replication* means that both the cases selected and the results predicted are similar (citation). The *theoretical replication* means that the cases are selected with the assumption from which contradictory results will derive (citation). In a

multiple case study, the case itself may be a person, an event, an entity, or other unit of analysis (Yin, 2017). When focused on a person, a single case concerns one individual, where a study of more than one person constitutes a multiple case study. This approach attempts to replicate the same findings across multiple cases by exploring the differences and similarities between and within cases. The evidence created in this way is considered robust and reliable (Yin, 2017)

Participants for this case study were recruited using purposeful criterion and snowball sampling strategies (see Baxter & Jack, 2008), and screened with the following inclusion criteria: adults over the age of 55 employed in a technology-infused workplace and possessing deep knowledge regarding their experiences with the topic of the study. I conducted eight in-depth face-to-face individual interviews with participants recruited for this study. Schram (2006) recommended a range of five to 10 participants for a qualitative study, stating that a larger sample size could be a barrier to an in-depth investigation of the phenomena under study. Yin (2017) proposed the usage of around six to 10 cases in multiple-case research arranged by selecting two to three cases for literal replication and four to six cases for theoretical replication.

Following recommendations by Stake (2006) and Stake and Trumbull (1982) on transferability of multiple case study findings through naturalistic generalization, the findings that are deemed important had at least three confirmations and validations by the participants. Each of the important interpretations that are derived from the thematic analysis of the data collected will be supported by the data gathered (Stake, 2008). Generalizing findings from research, either by gaining explicated or propositional

understanding deductively from quantitative experiments, or by constructing tacit interpretive understanding inductively from qualitative inquiries involves a transfer of knowledge from a study sample to another population. Unlike objective scientific generalization, naturalistic generalization generates possibilities for transferring knowledge more privately from subjective accounts from multiple cases (Melrose, 2009). Finally, methods to ensure the robustness and transferability of findings in a multiple case study were used in this study and included prolonged engagement, observation, triangulation, peer debriefing, transcript review , audit trail, reflexivity, and thick descriptions (Houghton, Casey, Shaw, & Murphy, 2013).

Definitions

The following definitions identify the key terms used with their intended meanings in the study.

Ageism: This term refers to prejudices or discriminations against individuals because of their chronological age coupled with stereotypes which include emotional, cognitive, and behavioral manifestations that are a part of a complex domain (Iversen, Larsen, & Solem, 2009)

Baby boomer: The generation cohort born between 1946 and 1964 (Bump, 2014).

Digital workforce: This term refers to the competencies developed by digital natives and digital immigrants to ensure effective communication and collaboration, to leverage technology while countering its potential downsides to benefit the organizations in which they work (Colbert et al., 2016).

Gen X: The generation cohort born between the years of 1965 and 1984. This population is also identified in the literature as Millennials (Bump, 2014).

Gen Y: The generation cohort born between 1985 and 2004 (Bump, 2014).

Human resources development (HRD): A central business function within an organization whose goal is improving employees as they progress in an organization, including training employees on ICT and social media policies, supporting dispersed global teams' web conferences across time zones, and executing appropriate talent management (Stephens & Dailey, 2014).

Information and communication technologies (ICT): Electronic devices that are used to store, retrieve, and disseminate information such as computers, telephones, satellite systems, and the Internet in the form of data and text (Afolabi & Abidoye, 2011).

Multigenerational workplace: A workplace where multiple generations exist and there is a concept of shared values that are identified by the generational group (Woods, 2016).

Older worker: A worker that is between the ages of 55 and 65 years old based on policy context (McCarthy, Heraty, Cross, & Cleveland, 2014).

Technology-infused workplace: A workplace whose primary day-to-day functions are dependent on and completed through ICT, which include Internet sources, information technology (IT) software and platforms such as intranets, and communication channels like email, web conferencing, and mobile technology applications (Stephens & Dailey, 2014)

Assumptions

For this study there were three major assumptions that drove the data collection and analysis. The first assumption was that the older workers' daily experiences in the workplace are transparent throughout the research study, resulting in an honest conversation from interviews conducted and data collected which will identify productivity limitations in technology-infused environments. In qualitative research, the approaches are geared toward interpretation and understanding (Eriksson & Kovalainen, 2015). While using an exploratory method of obtaining information from the older worker in a technology-infused workplace, addressing the knowledge gap relied heavily on the daily experiences that each older worker is willing to share. Because of the constant growth of research knowledge, it is imperative to assess the production processes of the knowledge and how it was obtained (Eriksson & Kovalainen, 2015).

The second assumption was that the older workers would provide factual instances that have taken place in their work environment so that the researcher's integrity is not compromised. It was also assumed that the data gathered, to include from in-depth interviews, recording, coding, and data analysis, would be collected and recorded without any adjustments (Stake, 2013). It is possible for new knowledge to arise through research as all research methods share connections that are close to philosophy (Eriksson & Kovalainen, 2015). Therefore, it was assumed that there would be a follow up of transcriptions that coincide with the interview data collected to ensure accuracy, as observation is a research tool when it is subject to providing checks and balances of results that are trustworthy (Merriam & Tisdell, 2015).

The third assumption for this study was that, by using an exploratory multiple-case study design, the specific information would be retrieved from multiple sources which would allow for triangulation to take place because of the plethora of information gathered. There must be some flexibility in research questions and designs during the research process as the research process will more than likely change (Stake, 1995). Based on the suggestions of Merriam and Tisdell (2015), it was assumed that observations would also be conducted to triangulate findings in conjunction with interviewing and document analysis to substantiate the findings. Hence, it was assumed that including observational methods coupled with the transcription of interview data would yield an accurate collection of data.

Scope and Delimitations

The scope is the boundaries and parameters of the study (Merriam & Tisdell, 2015). The focus of this study is based on the challenges faced by older workers with ICT adoption in technology-infused workplaces. Older workers are a valuable resource, and there are many tools that can aid in managing them efficiently (Zimmer et al., 2015), including innovative HRD solutions in today's technology-infused workplace (Stephens & Dailey, 2014). A gap exists in the literature on the actual experiences of older workers with ICT adoption in technology-infused workplaces to inform organizations on how to more effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017). This study may inform organizations on developing training protocols aimed at addressing technology barriers to productivity associated with the graying national workforce and supporting this employee

demographic group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017).

The delimitations of this study deal with what was included and excluded from the study sample. The unit of analysis in this study was the older worker in technology-infused workplaces. The older worker in this study is defined as the population of employees who are between the ages of 55 and 65 years old based on policy context (McCarthy et al., 2014, p. 374). A technology-infused workplace in this study is defined as a workplace whose primary day-to-day functions are dependent on and completed through ICTs, which include Internet sources, IT software and platforms such as intranets, and communication channels like email, web conferencing, and mobile technology applications (Stephens & Dailey, 2014). Participants for this case study were recruited using purposeful criterion and snowball sampling strategies (Baxter & Jack, 2008), and screened with the following inclusion criteria: adults over the age of 55, employed in a technology-infused workplace, and possessing deep knowledge regarding their experiences with the topic of the study. The older worker in technology-infused workplaces was chosen to align with the criteria set forth in the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990), one of the frameworks within the study's conceptual framework.

Limitations

When undertaking checks on the design of the research or when considering wider applications of the evidence, it is important for researchers to note any limitations that they themselves encounter or consider. The decisions regarding appropriate research

practices are dependent on the context, both social and ethical, as it pertains to the research question (Stewart & Gapp, 2017). These may become evident as the research is in progress (for example, difficulties of gaining access to particular study groups) or may emerge as the analysis and interpretation are being completed (missing experiences or perspectives among the study population). Documentation of these will help the user of the research to understand the boundaries of the evidence in terms of any wider inferences that can be drawn. The continual interaction, absorption, and reflection conducted by the qualitative researcher as it relates to data collection, analysis, and the interpretive processes helps to construct trustworthiness that establishes comparison and evidence (Stewart & Gapp, 2014).

There are three study limitations. First, there are only eight study participants and consequently the study might not be generalized to other populations. Entering into another person's perspective is the purpose for interviewing, hence making it possible for the researcher to enter into his or her world (Stake, 2010). Second, the participants' ethnicity and socioeconomic status (SES) backgrounds might not be representative of different populations. Collecting similar information from each participant does not pose a problem with credibility, each person is considered unique with viable information and perspectives (Merriam & Grenier, 2019). Third, since the participants have the right to not respond to questions that they consider intrusive or unpleasant, they might not respond to some of the questions posed by the researcher, which could impact study findings. Capturing the perspectives by the participants who live them, minus the preconceptions and values that are held by the researcher, represents important meaning

(Yin, 2011). Clarity can be achieved by using the language of the participants when discussing the setting, daily activities, or other aspects of life (Merriam & Grenier, 2019).

To control for these limitations study participants were chosen with varied ethnicities and SES backgrounds, and they were informed before the start of the study about the nature of the questions that will be posed to them. By studying participants in a real-world setting, variety will likely follow (Yin, 2011). It is the responsibility of the researcher to pose questions that make it clear to the participant what is being asked. In addition to using words that make sense to the participant, words that reflect the participant's worldview will improve the quality of data obtained (Stake, 2010).

Significance of the Study

The significance of a study must address why it is important to fill a gap in knowledge (Merriam & Tisdell, 2015). This research is important in that it may address a problem regarding a knowledge gap on older workers' experiences with ICT adoption in the workplace to inform organizations on how to more effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations. The results and recommendations arising from this research may prove useful to leaders and managers as well as HR departments in organizations that need this data on older workers' experiences with ICT adoption, so they may remain proactive in supporting any technology challenges faced by their graying workforce. Studies highlighted by Colbert et al. (2016) argued that digital natives, or those who are comfortable in the world of digital devices, and digital immigrants, those adults who have embraced technology and

adopted it as it becomes available, differ in their expectations of work and their work practices (Carlson & Isaacs, 2018).

Significance to Practice

HR managers frequently seem to believe older employees are less able or willing to learn, and, mainly due to a lack of data, not much is known about the training demand side or the opinion of older trained participants (Zwick, 2015). Organizations need management practice recommendations on how to more effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations (Rietzschel, Zacher, & Stroebe, 2016). Scholars reinforce that organizations need management practice recommendations on how to more effectively support the older worker's adoption of ever-evolving ICT devices in today's organizations (Rietzschel et al., 2016). For this to be accomplished, the gap in the literature regarding the actual experiences of older workers with ICT adoption in technology-infused workplaces must be addressed (Behaghel et al., 2014; Tams, 2017) to develop recommendations for HR managers to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces.

Significance to Theory

The results yielded from this research may prove useful on gathering new knowledge based on the generational divide in the workplace and increasing productivity of older workers in technology-infused organizations. This study extends its conceptual framework by offering original, qualitative data to, first, the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990), which "builds on

the assumption that individuals encounter certain opportunities as well as limitations in resources which require them to make choices regarding the allocation of those resources" (Ng & Law, 2014, p. 3), and, second, the age-inclusive training design framework (Williams van Rooij, 2012), which indicates that critical to the design process of HR training driving aging workers' improved performance and productivity is a solid understanding of the learner's work experiences with emerging technology.

Significance to Social Change

Implications for social change regarding workplace inequities must be addressed at the lower level so that the impact is felt in the daily lives of people in the community (de la Sablonnière, Bourgeois, & Najih, 2013). Ageism and its practice is a strong contributing factor that remains in the workplace across the United States as a means of discrimination (Harris, Krygsman, Waschenko, & Rudman, 2017). Ageism is defined as stereotypes, prejudice, or discrimination against people because of their chronological age (citation). Ageism includes cognitive, behavioral, and emotional manifestations that are a part of a complex domain (Iversen et al., 2009). Consequently, ageism reinforces social inequalities in the workplace as it is more geared towards older women (Rudolph, Toomey, & Baltes, 2017). This study is significant and bears social change implications for the American workplace because it gives voice to older workers, a demographic group that has been marginalized in many technology-infused workplaces due to preconceived notions of older/Boomer workers' tech savviness and ageism (Weeks, Weeks, & Long, 2017).

Summary and Transition

As the workplace evolves and workers continue to age, technology-infused organizations must diminish the challenges that are faced by closing the knowledge gap that often contributes to limited productivity. Older workers are valuable partners where human and social face-to-face relationships are created and formed (citation). Frameworks that depict an inclusive training design fail to focus specifically on the older worker, resulting in a warped viewpoint of what type of experience is faced daily. Considering the issues of having multiple generations within technology-infused workplaces, HR managers need to prepare current HR training practices related to developing technological transformations, with renewed mindsets and policies addressing the presence of a growing older workforce. For the older worker to remain relevant in the workplace, training protocols are needed to encourage social change and challenge the ageism reinforcing social inequalities in the workplace for the maturing workforce. This study is framed by, first, the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990 and the age-inclusive training design framework (Williams van Rooij, 2012).

The purpose of this qualitative exploratory multiple case study is to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces while using a descriptive, multiple-case research design. To address this gap in the literature on the actual experiences that an older worker has with ICT adoption in a technology-infused workplace, a multiple-case study method was used. This study is significant for supporting this employee group's adoption of ever-evolving

ICT devices in today's organizations to assist with the positive impact that will arise once the experiences of the older worker have been explored, documented, and linked with social change.

In Chapter 2, the literature review will focus on the factors that affect an older worker's productivity, such as lack of training, the responsibility of the older worker, HR policies, technology adaptation, and studies that will help support the research. Topics that will be discussed include the challenges that older workers face, impact of being an older worker, including ageism and the longevity of work life for today's older worker demographic.

Chapter 2: Literature Review

The specific problem is organizations need an in-depth understanding of older workers' experiences with ICT adoption in technology-infused workplaces to develop training protocols aimed at addressing technology barriers to productivity associated with the graying national workforce (Behaghel et al., 2014; Tams, 2017; Taylor et al., 2017; Zimmer et al., 2015). By using a synthesis of current and emerging ICT and training methods, inclusive human involvement can effectively target each generation (Barrios & Reyes, 2015). HRD must now focus on strategies to capitalize on the rising availability of older workers in the 21st century digital workforce (Moen et al., 2016; Young, 2013). The purpose of this qualitative exploratory multiple case study is to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. The daily experiences that older workers face in technology-infused organizations may contribute to productivity that is hindered due to the lack of training or understanding (Kraiger, 2017), as well as ageism on the job (Harris et al., 2017), which presents challenges (Colbert et al., 2016). To explore the gap while gaining a deeper understanding of the daily experiences that older workers face, the focus of this study highlights the specific challenges the Boomer cohort of employees faces with ever-evolving ICT in the workplace.

In Chapter 2, I will present the literature search strategy as well as the conceptual framework that guides this empirical study. The literature review of this chapter will present a synthesis of knowledge and critical analysis of scholarly sources on the following topics*:* the older worker in the workplace, the rise of a successful graying

workforce, ageism discrimination in the workforce, boomer cohort challenges in the technology-infused workforce, ICT challenges for the older worker in small and medium-sized firms, designing effective ICT training practices for older workers, and age-friendly human resource management practices.

Literature Search Strategy

The literature review is what every researcher looks for when starting a research study (Rowe, 2014). The literature review was researched with Google Scholar, Galileo, Google search engine, and the Walden University Library database, ProQuest. I used journals received from other experts in the field of older workers and technology usage that were verified in Google Scholar and Google search.

The key terms used were (a) *baby boomer*, (b) *digital workforce*, (c) *Gen X*, (d) *Gen Y*, (e) *human resources development (HRD)*, (f) *information and communication technologies (ICT)*, (g) *multigenerational workplace*, (h) *older worker*, (i) *technology-infused workplace*, and (j) *wearable technology*. A few of the key search terms were coupled together to determine if additional results could be found. The combined terms included (a) *older workers and technology*, (b) *older workers and training*, (c) *older workers and productivity*, and (d) *older workers and social change*.

The primary objective in the literature search strategy was to identify peer-reviewed scholarly papers on the issues providing background and rationale for the need for this study. I searched theoretical literature for studies focusing on older workers in today's digital workforce and relevant research on the possibility of a generational technology gap limiting their productivity in technology-infused workplaces (see Barrett

& Bourke, 2013; Guglielmi et al., 2016). What I discovered in updated peer-reviewed papers was that the older worker faces challenges in the technology-infused workplace because of the lack of training, leading to possible productivity effects. I used research based on ageism and ICT as a confirmation that older workers are a large part of the workforce and their possible premature exit results from the discriminatory job practices. Ageism reinforces social inequalities in the workplace (Rudolph et al., 2017), and this study will be significant in identifying social change implications for the American workplace by giving voice to older workers' experiences in technology-infused organizations (Weeks et al., 2017).

Conceptual Framework

This study is framed by, first, the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990), which "builds on the assumption that individuals encounter certain opportunities as well as limitations in resources which require them to make choices regarding the allocation of those resources" (Ng & Law, 2014, p. 3), and, second, the age-inclusive training design framework (Williams van Rooij, 2012), which indicates that critical to the design process of HR training driving aging workers' improved performance and productivity is a solid understanding of the learner's work experiences with emerging technology.

Research undertaken in the past about older workers has commonly been angled negatively, concentrating on what is wrong with older workers and the difficulties associated with managing an aging workforce (Brooke & Taylor, 2005). Peeters and van Emmerik (2008) chronicled how mental, cognitive, and physical changes occur as

individuals age. Humans inevitably experience losses in mental well-being, physical functioning, and cognitive resources as they age (citation). The loss of functioning and resources adds to the stereotypical image of older workers as having lower work performance and productivity, and as being unable to cope (Kanfer & Ackerman, 2004; Maurer, Barbeite, Weiss, & Lippstreu, 2008).

Despite declining resources connected with age, there is little link between work performance and age; instead, skills acquisition and adaptation may possibly safeguard older workers from declining productivity (Charness, Czaja, & Sharit, 2007). Brooke (2003), for example, conducted a cost-benefit analysis focusing on younger and older workers, and determined that investments in older workers (e.g., training, recruitment) were well worth their costs (e.g., workplace injuries, absenteeism) in comparison to similar investments made in younger workers. Add summary and synthesis to fully conclude the paragraph.

Older workers want to stay with an employer longer if their contributions are valued and they are treated with fairness, being that such attitudes promote a sense of belonging with the organization (Armstrong-Stassen & Schlosser, 2011). A compelling case can be made to increase understanding of the technology challenges faced by older workers as well as the opportunities they offer to employers, as the relative number of older workers who decide to stay in the technology-based workforce increases (Kraiger, 2017; Ng & Law, 2014). Add summary and synthesis to fully conclude the paragraph.

The selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990) was first developed through Baltes and Baltes' seminal research on the

psychology of aging, focused on how individuals manage their lives in a manner that promotes their well-being and personal development (Baltes & Baltes, 1990; Baltes & Dickson, 2001; Freund & Baltes, 1998), as well as through the work of Hobfoll (1989, 2002) on the conservation of resources to aid in explaining how individuals deal with declining resources as they age. Baltes and Baltes (1990) suggested that individuals adapt successfully to the loss of resources by adjustments in their use and allocation, so-called SOC.

The SOC framework for successful aging (Baltes & Baltes, 1990) builds upon the assumption that people encounter certain limitations as well as opportunities in resources, which leads to decisions concerning the allocation of those resources. Also, the SOC framework is in accord with socioemotional selectivity theory (Burnett-Wolle & Godbey, 2007), which describes that individuals discard unimportant matters and concentrate on important ones, as they perceive the time they have left as diminishing. According to Baltes and Baltes' (1990) SOC formulation, *selection* involves setting goals and choosing goal priorities. Elective and loss-based selection are the two kinds of selection that have been identified. *Elective-based selection* pertains to individual decisions based on available resources (citation). *Loss-based selection* involves the development of new goals that can be achieved with available resources (citation). Thus, goal selection may rely on personal value preferences (e.g., preference for work/life balance following childbirth), or may occur from the loss of resources (e.g., an individual may shift from competing to coaching after an injury). *Optimization* pertains to changes in resource allocation or refinement as a way of achieving higher levels of functioning in selected

goals (citation). Optimization involves the investment of energy and time in the acquisition, refinement, and application of goal-relevant resources (i.e., skills) (Young, Baltes, & Pratt, 2007). Finally, *compensation* involves the use and acquisition of alternate means to reach goals and to uphold functioning in the face of anticipated or actual resource loss (Ng & Law, 2014). Add summary and synthesis to fully conclude the paragraph and connect back to your study.

Charness et al. (2007) suggested that since technology is altering the way people work, obtaining technological skills is one way to maintain optimum work performance. Compensation can additionally entail conserving resources when the effort to procure new resources becomes challenging or difficult. SOC, in sum, is a life management strategy that aids individuals in maximizing age-related gains and minimizing age-related losses. To the present day, a small amount of research on SOC by older workers has centered on their adjustments at work (Moghimi, Zacher, Scheibe, & Van Yperen, 2017). Findings from two studies with a focus on subjective well-being (aging satisfaction) of older workers, aged 71 to 91, were reported by Jopp and Smith (2006). SOC processes among older adults, but within the context of leisure, were examined by Burnett-Wolle and Godbey (2007). How SOC can contribute to job performance was additionally examined by Yeung and Fung (2009); however, their sample was limited to Chinese sales insurance workers. Hence, little extant research on SOC has illuminated how older workers cope in the workplace in view of declining resources. Much of the research on SOC has, moreover, been quantitative in nature (Rozario, Kidahashi, & DeRienzis, 2011), and has concentrated on construct validity and measurement issues (e.g., Abraham

& Hansson, 1995; Freund & Baltes, 1998), thus restricting a deeper understanding of how older workers apply SOC in their adjustment to the workplace (Ng & Law, 2014).

To help organizations incorporate instructional design and systematic design models (Rothwell & Kazanas, 2008) in their training, the age-inclusive training design framework (Williams van Rooij, 2012) guides by a process and principles centered on establishing and sustaining performance that is both effective and efficient. Analyzing the target audience, as well as the context and content of the training, is crucial for assessing training needs. Audience analysis requires collecting data on pertinent characteristics, for example gender, age, education, job performance, job satisfaction, prior training, skills needed for the training, learning style, language, cultural differences, and training motivation (Williams van Rooji, 2012). The analysis of these data can be used to guide the selection of instructional strategies and supporting activities, materials, and technologies. Further, audience analysis helps a designer to create a more comfortable learning environment for trainees, thus motivating them and paving the way for more effective training outcomes overall (Lam & Hannah, 2016). Add summary and synthesis to connect back to your problem statement.

A sound understanding of the learner's individual characteristics is crucial in the design process, especially regarding their ability to process and apply information to bring about a change that will enable better performance (Kraiger, 2017). In this context, to realize age-inclusive training design, one approach is to target older workers' needs and limitations. Advocates of this approach, calling on research in cognitive psychology, gerontology, and instructional design, emphasize the importance of comprehending

barriers to learning in older workers (Taneva et al., 2016). These include health, cognitive aspects possibly impacting concentration and memory, and opportunities to impart knowledge in a way that suits older workers' preferences for and attitudes toward learning to empower them and support self-actualization (Williams van Rooji, 2012). There are common themes and findings to be found in conceptual studies that offer recommendations on what practices to adopt when developing age-inclusive training. It is increasingly recognized that the design of age-inclusive training falls within a larger context when examining organizational approaches to talent management (Krishnan & Scullion, 2016). Ongoing efforts to improve actions in this and related areas will enable HR professionals to develop and implement effective strategies for managing an organization's talent in a workforce that is today more multigenerational than ever (Alcover, 2017).

Literature Review

The Older Worker in the Workplace

Although there is not much existing research that offers an explicit definition of an older worker, the older worker as broadly defined is a worker between the ages of 55 and 65 years (McCarthy et al., 2014). Yet, there are many variations in current literature that define who may be an older worker. For example, Williams van Rooij (2012) mentioned that older workers are defined in age ranges from 35 to 60; however, Truxillo, Cadiz, and Hammer (2015) note that an older worker either is approaching retirement age or working past the retirement age, suggesting that the older worker is in their late 50s and 60s.

In the workplace where aging is inevitable, the nature of jobs and their availability are ever-changing (Parry & McCarthy, 2017). The concept of age varies tremendously among different contexts and cultures when determining who is considered an older worker (Truxillo et al., 2015). As such, to assume that older workers are a part of a homogenous group can have profound consequences for the organization and individuals alike (McCarthy et al., 2014). In other words, an older worker is a part of a stigmatized group in workplaces who draws negative connotations leading many to cope with an internal threat of self-identity by leaving the workforce as a means of avoidance (Desmette & Gaillard, 2008). Yet, the jobs that are readily available to the older worker are changing, causing transitions and temporary job obtainment to postpone retirement or retain income. Because of the higher percentages of employees who have decided to work past retirement age, many will need to be trained for their roles (Kraiger, 2017).

As a result, disengagement from work has become more gradual with the older worker, which results in employees working past their retirement age (BLS, 2016b; Eurofound, 2012). Consequently, the disengagement of work from the older worker impacts the organization in a negative manner as workers shy away from using technologies that their younger counterparts utilize (Tams, Grover, & Thatcher, 2014). Still, work barriers and disincentives as they relate to the terms of employment for the older worker result in an increase of fluctuating unemployment and retirement factors (Harris et al., 2017). Due to the lack of skills needed in the era of technological change, participation that is largely distorted adds to the declining sectors of economic activity (e.g., manufacturing) as well as early retirement, which may result in a list of factors that

affect employment rates, including social security and unemployment incentives. For this reason, being able to identify obstacles as well as the work disincentives of the older worker is necessary for the continued development of the labor force at present and in the future (van Dalen & Henkens, 2017).

Since older people tend to be more motivated at work, they identify stronger with the career that they have chosen and possess more resources that help with the demands that may seem challenging at work (Kim & Kang, 2017). The employee's opinions play a major role when determining the chances an older worker will receive as they pertain to employment. Age discrimination concerning the older worker throughout the hiring process and thereafter while at work induces decisions towards quitting a job or continuing unemployment. Over the last years, this issue has become extremely important, resulting in many Western countries' rising numbers of costs of early retirement aligning with the rising numbers of older people (Clark & Morrill, 2017).

Age discrimination, which is defined as the unsuitability between the job opportunities of older workers and their level of productivity (Harris et al., 2017), takes place among employers even though there is a lack of evidence that work performance declines with age (Ng & Law, 2014). The contribution of older workers to their workplace is exhibited through their work experience, quality of commitment, reliability, and positive attitudes. Negative opinions from others in the workplace may result in influencing older workers' technological competence, flexibility, and adaptation to new work patterns. Negative perceptions resulting from employers could attribute to job

displacements among older workers, which is a process that often results in retirement or unemployment uncertainties (Burgard & Seelye, 2017).

Provided that their work conditions improve, the older worker may consider working longer (Shacklock & Brunetto, 2011). Opportunities for development such as training and appreciative tactics may reduce the desire to retire prematurely. It should be made clear that, while the old-age part-time work contract is being used as a useful measure pointing to the positive attitude of the workplace towards its older workers, it is also served as a reduction tool for reducing the work of the older worker at an early stage (Cleveland & Hanscom, 2017). By way of explanation, it pushes them gradually out of the workforce as an effect of an exclusionary labor market and decreases the likelihood of older workers (especially those aged 55 to 59) to stay in the workforce. Scholars continue to point out that policy planners should consider the importance of employers' involvement in raising retention of older workers through the improvement of working conditions and training of their older staff (Steenstra, Cullen, Irvin, Van Eerd, & IWH Older Worker Research team, 2017).

Research on the theoretical propositions used to develop the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990) has not readily focused on how older workers cope in the workplace in view of declining resources. Much of the research on SOC bears a gap in a deeper understanding of how older workers apply the concepts of the framework in their adjustment to the workplace (Ng & Law, 2014). The selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990) was first developed through Baltes and Baltes' seminal

research following how older individuals manage their lives in a manner that promotes their well-being and personal development (Baltes & Baltes, 1990; Baltes & Dickson, 2001; Freund & Baltes, 1998). Hobfoll (1989, 2002) continued this theoretical work on explaining how individuals deal with declining resources as they age.

Baltes and Baltes (1990) suggested that individuals adapt successfully to the loss of resources by adjustments in their use and allocation, so-called SOC. Experimental studies on understanding aging and work performance are not possible because age levels cannot be manipulated (Charness, 2008). As a result, more qualitative research is needed to understand why some older workers cope more successfully with declining resources than others (Haase, Heckhausen, & Wrosch, 2013; Riediger & Ebner, 2007). Numerous scholars recommended documenting the experiences of older workers to extend the SOC framework by identifying the differing ways in which older workers manage life, cope, and contribute in the modern, technology-driven workplace (e.g., Kooij, 2015; Lee, Shao, & Vinze, 2018; Ng & Law, 2014). Experiences in the workplace as an older worker are vastly different than 50 years ago due to the impact of globalization and technological, political, economic, social, and demographic changes (Patton & McMahon, 2014). The effects of these changes are a direct result that many older workers are dealing with in the workplace either in the private sector, where the shareholders demand faster and bigger returns on their investments and consumers tend to expect continuous innovations at competitive prices, or in the public sector, where citizens expect better service delivery within the context of fiscal constraint (Cheung, Yeung, & Wu, 2014).

Relationships with the employee and their employers have been affected tremendously by the changing environment of the workplace and older workers are often well aware of the threat of losing stable employment (Cheung, Wu, & Yeung, 2016). Older workers typically bear the brunt of job losses that are caused by the increased focus on flexibility and leaner organizations (Wood, Wilkerson, & Harcourt, 2008). The SOC framework suggests that aging persons can maintain relatively elevated levels of functioning by maximizing gains and minimizing losses (Baltes, Staudinger, & Lindenberger, 1999). Selection strategies comprise decisions about the goals and outcomes to pursue. Individuals deliberately choose functional domains with which to focus their resources, whether it is through changing goals because of a decline in available resources or based on individual preferences (Baltes, Rudolph, & Bal, 2012). Optimization refers to the acquisition, refinement, and maintenance of means to achieve the selected goals, and compensation to the investment of resources in response to losses in functioning (Baltes et al., 1999). The older worker may allocate their efforts and resources in today's workplace to both optimize their performance in selected functional domains and achieve the desired results or compensate for losses and maintain the desired level of performance (Baltes, Wynne, Sirabian, Krenn, & De Lange, 2014; Moghimi et al., 2017).

The Rise of a Successful Graying Workforce

Because mortality rates are changing, people appear to age more slowly, leading to working later in life which is no longer considered to be unusual (Fisher, Truxillo, Finkelstein, & Wallace, 2017). Generally, as people age, their productivity levels in many

areas tend to take a downward spiral turn. Jobs that are available for older adults are likely to be different from the jobs that they attended school for, trained for, or have work experience in (Parry & McCarthy, 2017). Yet, researchers today see a wide disparity in how people age. Since individuals age differently, comparisons often used between people in different age groups may be less useful when factors are incorporated across a person's life span. Because the workforce is continually aging yet becoming more diverse, practitioners and organizational researchers are more interested in the context of work as it relates to the age role.

At the moment there is a solid base of knowledge on how the age of the worker and diversity in age among teams coincides with important outcomes, including work performances, job attitudes, and both occupational health and well-being (Hertel & Zacher, 2017; Truxillo et al., 2015). The effects of human resource management (HRM) practices on work outcomes may differ between younger and older workers as scholars have identified (Kooij, Jansen, Dikkers, & de Lange, 2014; Kooij, Tims, & Kanfer, 2015). Yet, literature has yet to touch upon how the graying workforce can successfully age at work, meaning a central assumption of SOC theory remains untested (Zacher & Rudolph, 2017).

The concept of successful aging was initially introduced to take a more positive perspective on the aging process, especially with regard to older adults' work ability and to make popular the right to challenge age discriminatory notions of universal age-related decline (Butler & Gleason, 1985; Rowe & Kahn, 1987, 1997). However, advocates of successful aging often do not consider that individual efforts are not enough to combat

age discrimination and that actions are also needed at political and organizational levels (Fineman, 2014). To prevent a one-sided focus on HR strategies for a successful graying workforce, researchers should also consider other individual factors (e.g., gender, health, SES) and contextual factors (e.g., social network, and geographical, economic, sociopolitical, and cultural context) that may also affect successful aging at work (Zacher & Rudolph, 2017). A combination of work design theories, job characteristic theories, and lifespan theories contribute to a comprehensive lifespan perspective on work design as it relates to the SOC framework (Baltes & Baltes, 1990; Hackman & Oldham, 1976; Truxillo, Cadiz, Rineer, Zaniboni, & Fraccaroli, 2012).

Consequently, Truxillo et al. (2012) proposed six task, knowledge, and social work characteristics (i.e., task significance, specializations, social support, job autonomy, skill variety, and interdependence) that are positively related to indicators of occupational well-being characteristics (i.e., job satisfaction, engagement) in older workers. Receiving and providing feedback along with variety and interaction outside of the organization are strongly related to occupational well-being among young workers (Truxillo et al., 2012). However, the demands of information processing and problem solving add complexity to the job and the effects of these work characteristics among the younger and older workers are heavily based on their specific nature, which is determined by their ability to process fast information (which tends to decrease with age) or experiential knowledge (which tends to increase with age or become more stable as age increases) (Kanfer & Ackerman, 2004; Truxillo et al., 2012). In follow-up studies, Truxillo et al. (2015) and Truxillo, Fraccaroli, Yaldiz, and Zaniboni (2017) argued that the interaction effects of age, age-

related person characteristics (e.g., cognition, personality, time perspective, experience), and work characteristics on occupational well-being are mediated by experienced meaningfulness of work, responsibility, and knowledge of results, leading to successful aging within a work context of the graying population (Truxillo et al., 2015; Truxillo et al., 2017).

Calls to understand why some older workers cope more successfully than others have, consequently, not been addressed (Tams, 2017). Identifying the contrasting ways in which older workers contribute and cope in the technology-infused workplace through the lens of the SOC framework can be fulfilled by using qualitative methods and exploring the technology-based work experiences of older workers (Ng & Law, 2014). There has been a lot of discussion regarding the graying workforce's ability to cope with changing technology. Besides the fact that this assumption may be outdated as numerous older workers become technologically savvy, a different mindset is recommended: let technology serve the individual and support the aging worker. In short, this is a challenge for organizations to consider not only how to help older workers adapt to technology, but also how to develop technology that is easily adopted by and actively addresses the needs of older workers (Truxillo et al., 2015).

The lifespan development theory implies that human development is flexible throughout the entire life span (Truxillo et al., 2012). To make proactive job adjustments, the graying workforce can be trained. The responses gathered through the process of gains and losses from an individual are allocated by developmental resources towards growth, maintenance, and loss regulations (Taneva et al., 2016). The behaviors that

employees initiate to bring about effective change, whether personal or organization related, is referred to as proactivity. For example, an older worker learning what is necessary to remain competitive in the workforce is considered proactive behavior (Fenwick, 2012). Additional examples include task negotiation, roles, and opportunities; improve work flow; preventative measures implemented; and adjustments with the job to accommodate the older worker's abilities and limitations (Claes, Hove, Vandevelde, Loon, & Schalock, 2012). These examples of proactive behavior correlate with job crafting as defined as it relates to a specific form of proactive work behavior. Job crafting is defined as "the physical and cognitive changes that individuals are willing to make in the task or relational boundaries of their work" (Wrzesniewski & Dutton, 2001, p. 179). As such, many argue that the older worker can use job crafting as a means of accommodation to adjust their jobs to their needs and abilities in order to successfully age at work (Kooij et al., 2015; Truxillo et al., 2012).

Older workers who choose to develop opportunities (i.e., positive development orientation) and pursue advancement perceive that there was an opportunity made available in their job (i.e., a positive climate for job development); on the other hand, those with a weak development orientation who determined that development opportunities were not available decided not to pursue advancement development opportunities. Two important positive dimensions of work-related well-being are job satisfaction and work engagement; job satisfaction is focused on the aspects of work, "an evaluative description of job descriptions or characteristics" (Christian, Garza, & Slaughter, 2011, p. 970).

Those older workers who choose to develop opportunities are more committed to and intend to remain with their organizations (Kim & Kang, 2017). The positive relationship that exists between development orientation and job development atmospheres may indicate that those older workers who desire to develop themselves will seek out jobs or organizations that offer more opportunities for development while being proactive to ensure that the developmental opportunities are being met. Regardless of the findings that draw to a close that HR practices related to growth, accomplishment, and advancement became less important with age (Kooij et al., 2013), the older worker's continued devotion to learn and manage their career as a strategy assists with the aging process at work. This involves actions to include furthering education, attending workshops, and voicing their short- and long-term career goals to their managers. Individuals with higher educational attainment and those who are involved in challenging jobs seem to be more resilient when identifying differences in cognitive aging (Rizzuto, Cherry, & LeDoux, 2012).

The organizational context could also enable learning and development behaviors. Older workers are often more engaged with learning and opportunities for development as a means of continued contributions towards the organization when they receive support from their organizations and they feel that they are being treated with respect and dignity. The opposite was shown to happen when older workers experienced negative age stereotypes (Iweins, Desmette, Yzerbyt, & Stinglhamber, 2013).

The SOC framework's fundamental goal is that the individual shifts their resources to deal with changes that are age related while effectively functioning (Baltes

et al., 2012). While adjusting in the workplace with their abilities and personal preferences, as well as creating opportunity for development with their knowledge, skills, experiences, and positive relationships, the investment of additional resources benefits the employee with their work engagement daily while replacing ineffective means and the activation of unused resources (Zacher, Chan, Bakker, & Demerouti, 2015). Older workers in the workplace environment compensate with experience and wisdom that has been gained throughout life experiences where changes in age-related cognitions occur (Ilmarinen, 2001; Kanfer & Ackerman, 2004; Ng & Law, 2014). Yet, there is no valid report with neurobiological evidence for declining processing capacities of older people in the absence of neurological disease (Ramscar et al., 2014). Fluid intellectual abilities that are associated with working memory, attention, and processing novel information and abstract reasoning typically decline with age (Kanfer & Ackerman, 2004). However, intellectual abilities, representing broad aspects of educational or experiential knowledge, increase with age. This knowledge that is achieved by work experience increases until the age of 55 to 60, and becomes stable until around the age of 85 (Staudinger & Bowen, 2011).

To remain a part of the organization, professional employees and the older managerial staff found that if their job assignments were interesting and felt important then the intentions of the individual displayed loyalty (Armstrong-Stassen & Ursel, 2009; Earl, Taylor, Roberts, Huynh, & Davis, 2017). Yet, if working longer is considered beneficial for the economy, society, and the worker, then policies pertaining to legislation could be adopted as an increase in incentives for individuals to remain in the labor force

and for organizations to employ older workers (Clark & Morrill, 2017). Similarly, Shacklock and Brunetto (2011) showed that the greater the importance of work to older workers, the more they were likely to remain working. The socio-emotional selectivity theory implies that age is related to increased preferences for and investment in emotionally meaningful goals. The increase of attention to emotional goals is a result of a greater complexity of experiences emotionally and an enhanced emotional regulation. Over a 10-year period, a study of emotional experiences was reported and revealed that people experienced positive emotions more often and, as they aged, their emotional experiences grew more stable (at least until retirement age) (Baruch, Sayce, & Gregoriou, 2014; Carstensen et al., 2011). There is a positive correlation between interpersonal relationships with colleagues and older workers who decide to continue working (Cheung et al., 2013). In addition, organizational bonds are a significant factor for older workers who decide to continue working past the expected retirement age (Büsch, Dittrich, & Lieberum, 2012). At the same time, social support, flexible work arrangements, and relationships with colleagues are also important for older workers' adjustment and growth in the workplace (Earl et al., 2017).

Ageism Discrimination in the Workforce

Ageism remains in the workplace across the U.S. and its practice is a contributing factor towards discrimination (Harris et al., 2017). Ageism is defined as prejudices or discriminations against individuals because of their chronological age coupled with stereotypes which include emotional, cognitive, and behavioral manifestations that are a part of a complex domain (Iversen et al., 2009). Similarly, ageism refers to beliefs that

are not tolerated, which contributes to injustice and inequality that marginalizes older adults (Harris et al., 2017). However, the classic definition of ageism was defined as prejudice by one age group toward another age group; it was later revised to include only two components, cognitive and behavioral, leaning towards stereotypical behavior and discriminatory acts against people because they are old (Butler, 1969; Iversen et al., 2009). The multiple definitions of ageism can be systematized by the conceptual components to determine whether there is an inclusion of cognitive, affective, and behavioral aspects (Iversen et al., 2009). The concepts that were introduced by Butler (1969) have exposed ageism to a conceptual reduction that is not worthy of the complexity of the concept (Iversen et al., 2009).

The social inequalities that are found in the workplace reinforce ageism and are geared more towards older women (Rudolph et al., 2017). Ageism can also be aimed at younger age groups; however, it is qualitatively different when geared towards older people because it is correlated with death and deterioration instead of the potential development of youth (Iversen et al., 2009). In contrast, Ayalon and Tesch-Römer (2017) argued that ageism is not an internal experience only, but it is manifested in various contexts and settings. Age stereotypes that are internalized contribute considerably towards beliefs about oneself and behavior towards others as they relate to emphasize ageism (Ayalon & Tesch-Römer, 2017). Yet, not all stereotypes of the older workers are negative as their larger roles are changing in the workplace with other aging groups (Truxillo et al., 2015).

An increase of attention regarding ageism and its functions at various levels, ranging from individual to institutional, leading to discriminatory practices that are linked to organizational and employer beliefs, attitudes, and behaviors (Harris et al., 2017). Even though ageism is established as a well-known phenomenon, based on the effects that ageism has on older people's attitudes at work, little effort has been made to reduce ageism in the workplace (Gaillard & Desmette, 2010; Iweins et al., 2013). High quality contact in the workplace between age groups is linked to positive perceptions of the older worker as being more competent and more sociable (Iweins et al., 2013). While striving to lessen the presence and impact of ageist attitudes in the workplace, it is important for an increase in daily interactions among multiple generations in the workforce to take place (King & Bryant, 2016).

The discriminatory views of situations that take place in the work environment are affected by one's own view on aging (Ayalon & Tesch-Römer, 2017). Older workers who have a higher level of job satisfaction and engagement, compared to the average worker, are said to have successfully aged in terms of occupational being (Zacher & Schmitt, 2016). Employees who are engaged in the workplace are not only physically present, but psychologically present and more focused while being attentive and integrated (He, Zhu, & Zheng, 2014). Additionally, the increase in commitment by the older worker to their career contradicts any stereotypes of motivational decline as it relates to age while at work (Desmette & Gaillard, 2008).

Current research on ageism targets the causes, the consequences, and the concepts of how ageism can be reduced, and yet, it fails to simplify the definition of ageism where

the aspect is conceptual (Iversen et al., 2009). A key barrier to maintaining and attaining work is often linked to ageism, which solely contributes to individual resistance of changes in attitude as it relates to extended work lives (Anderson, Richardson, Fields, & Harootyan, 2013; Harris et al., 2017). Compared to similar remarks that target sex or race, there is a contrast to the way society responds towards older individuals, which leads to ageism being neglected (Iversen et al., 2009). Providing a conceptual aspect will allow a higher degree of reliability and validity with studies on ageism in the future as well as systematize the current research while targeting future studies with certain types of ageism (Iversen et al., 2009).

Because there are no social sanctions against individuals who express prejudices or stereotypes against elderly people in a negative manner, it is generally accepted (Iversen et al., 2009). Stereotypes hinder older workers who seek employment in today's labor market (van Dalen & Henkens, 2017). The cost of retaining or hiring older workers must be considered by employers (Clark & Morrill, 2017). Employers must recognize and make others aware of the changing demographics in the workplace (Clark & Morrill, 2017). By doing this, employers will be better positioned to accommodate delayed or prolonged retirement transitions and create compensation and employment policies that will reap the benefits of older workers being employed (Clark & Morrill, 2017).

In reality, the aging workforce must be addressed by employers and the preconceived notions that employers have of older workers as they relate to attitudes and personal perceptions may prove to be true but are more likely to change (van Dalen &

Henkens, 2017). Since older workers are highly compensated, opportunities for advancement by younger workers in the workplace may be restricted causing the employer to either restrict or assist the worker's ability to remain on the job (Clark & Morrill, 2017). As workers are adamant to delay retirement, policies must be reviewed to determine how workers will be accommodated (Clark & Morrill, 2017). However, if older workers do not step aside, they can be perceived as a burden on an ambitious younger generation (North & Fiske, 2015). As the workforce continues to age, the development of strategies in organizations is needed to engage the mature worker (He et al., 2014). Ageism also has negative and detrimental effects on older adults that are not money related (King & Bryant, 2016). Once issues have been identified and addressed, the various ages of all employees and their relationships can be facilitated (Sanner-Stiehr & Vandermause, 2017).

Boomer Cohort Challenges in the Technology-Infused Workforce

The American workforce is ageing at a rate never seen before by demographers (Segel-Karpas, Bamberger, & Bacharach, 2015). In 1992, 29% of all American employees were aged 45 and above; by 2013, that figure had risen to 44% of all workers. The fastest growing age cohort, popularly known in America as the Boomer cohort, is 65 years old and above. In 2016, as many as 7.6 million Boomers were employed in the U.S., and this number is expected to almost double by 2022 (BLS, 2016b). The workplace is also changing at a faster rate than ever before (Clark & Morrill, 2017). Approximately 47% of all American jobs will become automated in a decade or two, with certain jobs at higher risk for redundancy due to the expansion of the technology-

infused workplace (Frey & Osborne, 2017). These changes in the labor market will necessitate more employee training and retraining in ICT, and a large portion of the trainee cohort will comprise workers from the Boomer cohort (Colbert et al., 2016).

Workers of various ages approach work and life with eclectic perspectives which may prove beneficial and act as an enhancement to the workplace by offering an array of complementary skills; however, challenges can arise (Sanner-Stieher & Vandermause, 2017). Research regarding generational differences in the workforce imply multigenerational work groups bring an array of different skills to a workplace (Sanner-Stieher & Vandermause, 2017). As individuals age, the observation of remaining active decreases while the dependency ratio increases and becomes unsustainable (Parry & McCarthy, 2017). On the other hand, task performance is not related to age, it is the complexity of the job and job design that may affect the relationship between age and outcome (Truxillo et al., 2012). Yet, there are differences of opinion with regard to which generations fall as today's workforce consists of individuals from four generations: The Silent Generation (born 1925–1945), the Baby Boomers (Boomers; born 1946–1964), Generation X (GenX; born 1965–1981), and Generation Me (GenMe, also known as GenY, Millennials, nGen, and iGen; born 1982–1999) (Twenge, Campbell, Hoffman, & Lance, 2010, p. 1118)

Although the generations are not sharply divided, their characteristic features are relevant for the age groups depicted (Bencsik, Horváth-Csikós, & Juhász, 2016). The comparison of multigenerational individuals entering the workforce amongst current theories, particularly the Millennials (who were born in the early 1980s), exhibits a

connection to technology and a lifelong priority of meaningful work (Twenge et al., 2010). As such, the Millennials were the first wave of the digital generation who were born into the technology world (Bencsik & Machova, 2016).

The Millennial generation focuses more on external rewards than Baby Boomers do, which may depict an attitude of entitlement as some would argue to be a well-known characteristic of their generation (Sanner-Stieher & Vandermause, 2017). As millennials constantly battle the allegations of entitlement, the Baby Boomers perceive that they are being pushed into retirement early, resulting in contention surrounding age in the workplace (Sanner-Stieher & Vandermause, 2017). The diversity that is found in the workforce of organizations and in most companies is comprised of a multigenerational cohort of workers which presents great challenges and can lead to greater outcomes (Lawton & Carlos Tasso, 2016). In contrast, as diversity in age increases in the workplace, there are greater opportunities for shared experiences between generations and as older and younger workers continue to grow in the workplace, there will be less conflict and more diverse learning (Parry & McCarthy, 2017). For example, millennials have an undeniable edge where technology is utilized and based on the relationships created, almost every workplace is technology dependent (Sanner-Stieher & Vandermause, 2017).

Millennials are highly qualified with digital knowledge; therefore, it is easy for them to quickly manage new tools and devices as they relate to IT considering their communication mainly takes place online and in virtual space (Bencsik & Machova, 2016). Given the overview of the multigenerational workforce, managers gain an

understanding of real generational differences and an opportunity to respond (Brink, Zondag, & Crenshaw, 2015). Cooperation is imperative when managing younger generations for knowledge sharing and knowledge transfers to be effective in multigenerational workplaces (Bencsik & Machova, 2016).

It is evident that technology plays a vital role in everyday life, and for the Baby Boomer, adjusting to the rapid advancement of technology has been quite the challenge (Bencsik & Machova, 2016). Baby Boomers, who are known for their stances on issues that are important, are characterized as team players who are loyal and are also known for their strong organizational commitment (Sanner-Stieher & Vandermause, 2017). Baby Boomers grew up prior to the arrival of personal computers being accessible in every home and email, hence technology has affected each generation differently. When questioning members from each generation about their values and their perceptions of what other generations valued among the 15 work-related values, Lester, Standifer, Schultz, and Windsor (2012) noted that there were misconceptions among the diverse groups in regard to the 15 values. For example, Millennials believed that Baby Boomers respect formal authoritative figures more than they do, which are considered misplaced perceptions that may enhance the reason generational differences are simply overstated.

The evidence strongly suggests that the differences in generations play a smaller role than suggested by the popular press. In another example, Costanza, Badger, Fraser, Severt, and Gade (2012) found little confirmation of meaningful patterns where differences were found due to the effect size being small to moderate at best in a meta-analysis of generational differences in work styles. More importantly, the strongest

relationships noted were connected to job satisfaction, turnover intentions, and commitment where the older generations were more satisfied and not likely to turnover (Costanza & Finkelstein, 2015). Even though the percentage of older workers is being driven up by individuals who have decided to remain active in the workplace, in a recent review supporting an aging workforce, Truxillo et al. (2015) stated that people are aging more slowly, hence working later into life (Toossi, 2012). Because there is a need to sustain through retirement, most of the motivation to continue working is financial, as a method to strengthen personal retirement resources (Truxillo et al., 2015). Undoubtedly, disengagement from work is becoming more evident as there is a higher increase in percentages of employees who are working past their retirement age (BLS, 2016b) either completing alternate work assignments by working part-time or temporarily while remaining employed (Hertel & Zacher, 2017).

Future jobs will consist of healthcare, retail, and technology-based jobs, leading to a decrease in manufacturing and agricultural jobs as predicted for the U.S. (BLS, 2016b). Older workers who were well versed as laborers may find it difficult to remain prevalent in the technology wave as the advancements in technology use are creating a reduction in manual labor. Organizations face challenges of competitiveness economically, globally, and technically, finding it difficult to decide if mobile computing and social media are immediate communications for employees, managers, customers, and suppliers. For this reason, providing training for the older worker is imperative (Noe, Clarke, & Klein, 2014).

ICT Challenges for the Older Worker in Small and Medium-Sized Firms

In 2014, U.S. small and medium-sized enterprises (SMEs) employed 56.8 million people, or 48.0% of the private workforce (SBA Office of Advocacy, 2016). By 2022 approximately 15 million employees employed in SMEs will be age 65 and older (U.S. Census Bureau, 2013). In comparison to the labor forces of previous decades, the workforce of today is older and more ethnically diverse, as well as highly comprised of more women (Toossi, 2012). The changes in the labor force are gradual and the population's growth is the main factor in the growth of the labor force, yet during the recent recession, the participation in the aggregate labor force decreased tremendously (Toossi, 2012). Today's workforce consists primarily of Baby Boomers, Millennials, and Gen Xers, however, there is still a small representation of the Silent Generations, who are aged 70 or older (Ng & Law, 2014). The perceptions that are prevalent among managers as related to the multiple generations in today's workplace create unprecedented relationship challenges (Costanza & Finkelstein, 2015). Hence, it is necessary for multiple generations in the workplace to work side by side and interact effectively together (Lester et al., 2012).

In a recently published large-sized longitudinal study, He, Messacar, and Ostrovsky (2017) stated that very small and small firms—very small firms employing 1–19 workers and small firms being defined as those with 20–99 workers—with the highest average ages included finance, real estate, and management. In contrast, the industries with the lowest ages were accommodation, arts, and retail trade, a statistic that is understandable given that these sectors tend to employ a large number of young, low-

wage workers. The study reported that changes in SMEs' workforce ages and the share of older workers in firms from 2003 to 2010 resulted in a more stable workforce with less turnover than larger firms, whose turnover rates were higher than those of smaller firms, whose owners, managers, and employees tend to stay with their firms. The study provides useful insight into the relationship between key characteristics of firms and their workers, such as age, and further research may help explain age of workers in relation to firm productivity, profitability, competitiveness, survival rates, innovation, and adoption of new technologies (He et al., 2017).

In today's diverse workforce, one of many challenges is the attainment of knowledge, which is an imperative factor for production that increases in importance where information processing depends on the use of ICT (Meyer, 2011). A large misconception is that the older worker is resistant to technology, yet it is understood that in order to compete successfully in today's environment technology is valuable (Lester et al., 2012). On the other hand, older workers offer their valuable experience, which provides more benefits to firms than the newest knowledge or techniques with the younger worker (Lee & Yang, 2016). ICT usage is crucial for the performance and competitiveness of firms; therefore, comprehending the importance of the relationship between the age composition of the workforce and the adoption of technology is imperative for small and medium-sized firms (Meyer, 2011). The differences in value as they relate to technology and communication differ immensely across generational factors, and easily influence the assessments that assist with teamwork and continuous

learning (Lester et al., 2012). Consequently, different generations interpret their work values based on their generation's point of view and perceptions (Ng & Law, 2014).

Productivity is another key challenge among older workers, and as a result there is a need for the older worker to have access to up-to-date trainings, employment services, and better working conditions (Lee & Yang, 2016). Productivity tends to decrease as people age (Lee & Yang, 2016) and older workers are less qualified and less likely to use ICT in comparison to younger workers (Meyer, 2011). The intensive use of ICT in the knowledge-intensive service provider (e.g., tax consultancy and accounting, architecture) and in the technology service provider (e.g., software and IT services, telecommunication services) sectors, which rely on a continuous adoption of new technologies and software, render the structure, quality, and internal organization of human capital exceptionally important. Rapid technological progress and the fast depreciation of knowledge on the one hand and demographic development on the other present a great challenge for these firms (Carlson & Isaacs, 2018; McCausland et al., 2015). Empirical evidence indicates that older workers are less likely and less qualified to use ICT compared to younger employees. Because ICT is developing on a constant basis and new applications and software regularly appear, adaptation to these modern technologies and applications are needed for adoption by the employee (Lee & Yang, 2016).

Multiple empirical studies have been conducted with mixed results on the relationship between the age of the workforce in firms and the productivity therein and the innovative use of recent technology (Cataldi, Kampelmann, & Rycx, 2011; He et al., 2017). One of the surveys administered in this study insinuates that the relationship

between both the age of the worker and creative performance follows a profile that is hump shaped (Frosch, 2011). Furthermore, greater age diversification within firms can positively affect productivity (Cucculelli, Mannarino, Pupo, & Ricotta, 2014). Firms that employ a larger number of younger workers are more likely to become well versed with new technology, but the overall age of the workforce does not always have a profound impact on technological innovation. In contrast, Behaghel et al., (2014) concluded that firms with a large share of older workers or a wider age dispersion tend to have relatively low survival rates.

Finally, the biggest challenge is how today's managers in SMEs can effectively lead a multigenerational workforce in the ICT sector. Additionally, small and medium-sized firms might be less attractive to employees due to the smaller or non-existing internal labor markets. On the other hand, demographic changes may have a greater impact on SMEs in terms of technology adoption due to their small internal labor market. Therefore, understanding the relationship between the age composition of the workforce and technology adoption is important for small and medium-sized firms (Fleming et al., 2017; Lee & Yang, 2016), which by 2022 will employ approximately 15 million Americans categorized as older workers (U.S. Census Bureau, 2013).

Designing Effective ICT Training Practices for Older Workers

The digital workforce has introduced technology throughout the course of interactions that may be used at work based on their expertise (Colbert et al., 2016). If an older worker is proven beneficial to the company's productivity the company may be willing to retain and re-train older workers (Perry, Golom, & McCarthy, 2015). The

quality of interaction is a result of the prevalence of technology in our daily lives (Colbert et al., 2016) and yet, the age of an individual could play a role in their perceptions of ICT, resulting in an effect on its use and performance (Ferrara, 2016). Although important interactions are derived from the presence of technology, there is an impact where an employee's identity development and expression manifest in ways that may have important implications for organizations (Colbert et al., 2016). Whether sending a text message or creating a social media profile, there is an opportunity for an individual to create a false image rather than an authentic self (Turkle, 2015).

Through technology use many are attached to their work outside of the traditional hours while intertwining work and leisure, making it hard for organizations to set rules for work and time off (Ng & Parry, 2016). With the increase of technology usage, major changes have taken place in how we live our lives (Colbert et al., 2016). The world has become more attached, largely because of the instant access to the Internet and the easy connection to various types of information and communication websites that are available via the Internet (Ferrara, 2016). The digital skills of the workforce and the way technology is being used in the workplace will continue to develop and change (Colbert et al., 2016). Consequently, to reduce gaps in competency, organizations rely on training programs considering that technology is continually developing and evolving while creating gaps in a technology-dominated workplace (McCausland et al., 2015).

The differences that exist in work values among the generations will certainly create generational conflict in the workplace (Ng & Parry, 2016). It is normal for needs to change as people get older (Cole, 2016). Yet, a worker should be considered an aging

worker as soon as she/he starts working in any organization (Dordoni & Argentero, 2015). As people begin to perceive the environment and guide their beliefs and expectations about members of a social group, stereotypes begin to form over time (Dordoni & Argentero, 2015). Because of the changing composition of the workforce, both younger and older workers could be impacted by age stereotypes as it is a relevant phenomenon (Dordoni & Argentero, 2015). Age equals experience, knowledge, and skills which are valuable qualities that individuals in the workplace should offer (Cole, 2016). Now that there is an influx of Millennials who are becoming managers of an increasingly older workforce, the perceptions of each other may ignite additional workplace conflicts (Arnold & Yue, 2012).

Since the digital workforce will share the workplace with coworkers who are older and less comfortable with the use of technology, organizations will need to regulate the conflicts that will take place once the groups come together (Colbert et al., 2016). Employers must re-evaluate the costs and the advantages of hiring and retaining older workers (Clark & Morrill, 2017), and it is equally as important for employers to utilize the right tools to attract the Millennials (Ng & Parry, 2016). Given that many of the organizational policies and HRM practices were designed by Baby Boomers during their tenure as a means of workplace organization, the younger generation may view the policies and practices as outdated given the nature of career shifts, greater demands with work and family, and the advancement of technology (Ng & Parry, 2016).

While the global workforce continues to age, organizational leaders face a knowledge gap on how to the recruit the right people who exhibit the appropriate skills

(Kraiger, 2017; Shacklock & Brunetto, 2011). Aging workers who exist in the workforce possess relevant skills that newer workers lack while continuing the efficiency of organizational operations (Joy & Haynes, 2011). Although it is possible for mentorship to take place in the workplace, the knowledge transfer from one generation to another may not happen prior to an older worker's retirement (Ng & Parry, 2016). The continued reliance on ICT in the workplace increases the demand for knowledge and for technologically skilled workers. By utilizing a synthesis of current and emerging ICT and training methods, inclusive human involvement can effectively target each generation (Barrios & Reyes, 2015).

Age-Friendly Human Resource Management Practices

HRM and their practices are systems that develop, motivate, attract, and retain employees to make certain that an organization's human capital contributes to the overall achievement of the objectives in the organization (Taneva et al., 2016; Veth, Korzilius, Van der Heijden, Emans, & De Lange, 2017). There is a rise in concern for employers and organizations regarding the rapidly aging workforce (Ng & Parry, 2016). Employers must discuss the demographics that are changing in the workforce (Clark & Morrill, 2017). The way that work is carried out and structured has been affected by the development of technology. The digital workforce has introduced technology throughout the course of interactions utilized at work from an individual's expertise (Colbert et al., 2016). The relationship between an employee's behavior at work, their attitude, and the practices of HRM have been studied over the past years as empirical research (Van De Voorde, Paauwe, & Van Veldhoven, 2012; Wright & Nishii, 2007), leading HRM

practices to include flexible work arrangements, training, and decision-making participation as an enhancement of performance and examples of good practices (Veth et al., 2017). In certain training contexts and demographic groups, the effect of trainer characteristics may be influential (McCausland et al., 2015).

The availability and/or uptake of HR practices has been found to be positively related to a number of individual work outcomes, including job performance and intention to extend working lives; availability of HR practices and use of SOC strategies, as explained in this study's Conceptual Framework earlier in Chapter 2, are positively related to individuals' experiences of thriving and negatively associated with employees' experiences of surviving at work (Taneva et al., 2018). Some research in the last decade has focused on the HR policies and practices that may be particularly important for older workers and how the effects of HR practices vary with age (Kooij et al., 2013). A recent study of older workers regarded SOC strategies as a natural consequence of their accumulated expertise, and not as a way of compensating for decline, and the use of SOC strategies and performance is consistent with several previous studies (Weigl, Muller, Hornung, Zacher, & Anderer, 2013); but its strength is perhaps surprising (Bal & Boehm, 2017; Cleveland, Fisher, & Walters, 2017) given that stronger effects of SOC have been identified amongst people in low-complexity jobs.

The effects of different HR practices regarding older employees' work outcomes have been mixed throughout research findings (Jung & Takeuchi, 2018). In a study that included over 4,000 organizations in the Netherlands, Bal and Dorenbosch (2014) found that those with high proportions of older workers gained (in terms of their performance)

from work schedule practices, while organizations with high numbers of younger workers were more likely to benefit from development practices. Veth et al. (2011) discovered that maintenance HR practices and, more specifically, those related to reducing the job demands of employees, were enforced more frequently than development HR practices in the health sector by organizations. However, the development practices were associated higher with job enrichment and self-efficacy (compared with maintenance practices). Kooij et al. (2013) reported that the partnership between development HR practices and *well-being* weakened with age, while the opposite was true for maintenance HR practices. In contrast, the development of HR practices (more specifically, job enrichment practices) were lumped together with higher *job performance* among older (compared with younger) workers. It appears that as workers age, maintenance HR practices may help them to feel better, but development HR practices guides them to work better (Taneva, 2017).

Moen et al. (2016) focused on some of the challenges that the older workforce faces involving outdated HR logics and practices. Employers and organizations need to prepare to revise current HR and training practices related to developing technological transformations, with renewed mindsets and policies addressing the presence of a growing older workforce (Damman, 2016). By developing a new logic and practices, organizations can retain the older workers needed to meet modern and global business challenges. To reach this goal, organizations need to design uniform policies that are not limited by age and inclusive of older workers in the 21st century (Moen et al., 2016; Silver & Williams, 2016).

Some theoretical and empirical works dispute that certain HR practices and SOC strategies become more important as workers age (e.g., Baltes & Baltes, 1990; Kooij et al., 2013). HR managers are aware that the training and development opportunities that are available for the older workers are viewed as being irrelevant to them, so it is crucial not to "blame the victim" if an older worker's take-up of training is disappointing. Additionally, it is important to recognize that feedback from immediate bosses and informal day-to-day relationships carry more weight than formal performance appraisal processes (Buckingham & Goodall, 2015). Not only do these informal processes let older workers know how they are doing, they also allow an opportunity for older workers to craft their contribution, negotiate their roles and responsibilities, and feel they are being respected and trusted (Martin et al., 2016; Zacher, Kooji, & Beier, 2018).

Such arrangements may increase work flexibility and help older workers deal with work–family balance effectively (Thrasher, Zabel, Wynne, & Baltes, 2016). For this reason, it is important that supervisors of older workers are forewarned of these dynamics, and that they know how much room is allotted in the organization to manipulate when making informal arrangements (Bal & Jensen, 2015). Finally, HR managers might consider whether they are thinking adequately about retirement preparation and pathways that lead to opportunities for post-retirement work. This seems to be an area of missed opportunity for encouraging not only a withdrawal from work, but also opportunities to grow in late career and thrive (Pass, 2018; Taneva & Arnold, 2018).

Identifying the Gap in the Literature

The global issue of the aging workforce posits the dilemma on whether older workers should be retained to help optimize the productivity of all workers while ensuring equity in the workplace (Clark, 2017). The aging workforce poses a challenge for technology-infused workplaces and their HRD must now focus on strategies to capitalize on the rising availability of older workers in the 21st century digital workforce (Moen et al., 2016; Young, 2013). Due to the age-related transformation of the labor market taking place simultaneously with the rapid growth of a global digital workforce, how older workers leverage ICT in the workplace potentially may create conflicts between generations (Haeger & Lingham, 2014; McCausland et al., 2015; Taylor et al., 2017).

The large Boomer cohort (born in the U.S. from 1946 through 1964) is growing older and with an extended life expectancy, continuing to leave organizations with a historically unprecedented older workforce (Moen et al., 2016). Many employers have concerns about older workers not only regarding issues of technology adaptation, but also age differences in decision-making time, an issue that was examined in depth by Löckenhoff (2011). Despite the increase in older workers and the research findings regarding ageism and older workers' productivity levels, older workers are often depicted as nonexistent and the elderly are viewed as a burden in the workplace (Taylor et al., 2017). Additionally, this form of ageism is felt even more by older minority workers in the American workforce. The literature on workplace inequality clearly depicts women and minorities as the frontline receivers of employer biases, ageism, and susceptibilities

to downward mobility in today's technology-infused workplace (Wilson & Roscigno, 2018).

Older workers are a valuable resource, and there are many tools that can aid in managing them efficiently (Lawton & Wheatley, 2018; Zimmer et al., 2015). Innovative HRD solutions may be key from becoming a replaceable employee in today's technology-infused workplace (Zwick, 2015). HR trade publications along with the general training literature stress the need to design training that fits the learner characteristics of each generation in the workforce (Manuti & de Palma, 2018). Charness et al. (2007) reviewed considerations and recommendations related to aging and workplace technology, including design principles, but additional empirical work about the effects of these types of workplace interventions is still needed. The extent to which training is being designed to be inclusive of older workers is, however, unclear (Truxillo et al., 2017). A literature gap exists in the extant literature on the specific challenges the Boomer cohort of employees faces with ever-evolving ICT in the workplace (Tams & Hill, 2017). Organizations need an in-depth understanding of older workers' experiences with ICT adoption in technology-infused workplaces to develop training protocols aimed at addressing technology barriers to productivity associated with the graying national workforce (Gordon, 2018; Taylor et al., 2017).

Summary and Conclusions

This chapter has reviewed and critically analyzed the scholarly literature on the place of older workers in today's digital workforce and how a generational technology gap may limit their productivity in contemporary technology-infused workplaces, where

ICT is applied throughout organizational life (Barrett & Bourke, 2013; Guglielmi et al., 2016). The literature revealed the emergence of training protocols that can be utilized to dismantle barriers regarding technology for the aging workforce. The literature search strategy was also presented to show the research database that was utilized to search for relevant journals and display key terms as a support for the study. This was followed by a summary of the study's conceptual framework comprising the selection-optimization-compensation (SOC) framework for successful aging (Baltes & Baltes, 1990), which posits that these three fundamental processes of developmental regulation are essential for successful development and aging. Evidence of a combination of HR training and the age-inclusive training design framework (Williams van Rooij, 2012) was utilized in the literature review regarding issues of improved performance and that productivity in the workforce for the older worker is interconnected with emerging technology.

Research on the older worker revealed information about ageism and how the older worker is perceived in the multigenerational workplace, and how those perceptions may be dismantled by using updated HR policies to educate and inform, including the integration of emerging technology. The challenges of the older worker showed the needed progression for embracing the adoption of technology to enhance productivity in the workplace. The challenges of the older worker with emerging technology in small to medium-sized firms in the workplace explained how the older worker may become disengaged and forced to retire prematurely or become unemployed. Lastly, HR age-friendly practices were presented to show how influential training practices for the older worker can be if there is a unified workplace. In the future, organizations should consider

implementing training for the older worker as a measure of sustaining their productivity and relevance in the workplace.

In Chapter 3, the research method for qualitative, descriptive multiple-case study research will be discussed. Next, the presentation of Chapter 3's sections will include the process for recruitment, participation and data collection, limitations, and ethical procedures, followed by the data analysis which will address any issues of trustworthiness in the study.

Chapter 3: Research Method

The purpose of this qualitative exploratory multiple case study was to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. To address this gap, and consistent with the qualitative paradigm, a multiple-case study methodology was used to meet the purpose of the study. Semistructured interviews with eight older workers in technology-infused workplaces, archival data in the form of government labor reports (Yin, 2017), and reflective field notes (Katz, 2014) were used to provide data in response to the study's CRQ. Meeting the purpose of this study may inform organizations on developing training protocols aimed at addressing technology barriers to productivity associated with the graying national workforce and supporting this employee demographic group's adoption of ever-evolving ICT devices in today's organizations (see Behaghel et al., 2014; Tams, 2017). The results yielded from this research may be significant to theory by offering new knowledge based on older worker's experiences from within the generational divide in technology-infused workplaces.

This study bears social change implications for the American workplace in giving voice to older workers, a demographic group that has been marginalized in many technology-infused workplaces due to preconceived notions of older workers' tech savviness and ageism (Weeks et al., 2017). This chapter will provide a detailed presentation on the following: research methodology and design rationale, the participant selection strategy, the role of the researcher in data collection and analysis processes,

assumptions and limitations of the study, ethical considerations, and issues of trustworthiness.

Research Design and Rationale

In line with recommendations for further research by scholarly researchers (Behaghel et al., 2014; Tams, 2017; Zimmer et al., 2015), the findings of this empirical investigation are aimed at advancing knowledge on older workers' work experiences with ICT adoption to contribute original qualitative data to the study's conceptual framework. Qualitative data collected in this study were analyzed to understand emergent concepts, linkages, and meanings based on participant responses (Yin, 2017). In line with the purpose of this study, the study's CRQ is as follows:

CRQ: What are the daily experiences of older workers with ICT adoption in technology-infused workplaces?

The global issue of the aging workforce posits the dilemma on whether older workers should be retained to help optimize the productivity of all workers while ensuring equity in the workplace (Clark, 2017). Many employers have concerns about older workers not only regarding issues of technology adoption, but also age differences in decision-making time, an issue that was examined in depth by Löckenhoff (2011). Despite the increase in older workers and the research findings regarding their productivity levels, older workers are often depicted as nonexistent and the elderly are viewed as a burden in the workplace (Taylor et al., 2017). Organizations need management practice recommendations on how to more effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations

(Rietzschel et al., 2016). For this to be accomplished, the gap in the literature regarding the actual experiences of older workers with ICT adoption in technology-infused workplaces must be addressed (Behaghel et al., 2014; Tams, 2017).

This study was qualitative in nature. The goal of qualitative research is to explore experiences from the vantage point of people living within a specific context; this method is associated with the constructivist paradigm (Cooper & White, 2012). Social constructivists challenge people to be more critical of their understanding of the world and themselves, by embracing a collaborative nature of learning thus practicing objectivity when interpreting interactions between the individual and the environment (Burr, 2015). Qualitative research methodologies used within the constructivist paradigm help victims of social oppression to audibly express their experiences with dominant cultural and social groups (Cooper & White, 2012; Merriam, 2002).

When the focus of the data is individually based, the study's central phenomenon, in this case older workers' daily experiences with ICT in technology-infused workplaces, is the context and not the target of study (Eisenhardt & Graebner, 2007; Yin, 2017), and, therefore, the investigation becomes an employee and not an organizational study. In an employee study, the optimum qualitative design to retrieve data with the goal of theory building is a descriptive, multiple-case study design (Eisenhardt & Graebner, 2007). The unit of analysis in this study was the older worker in technology-infused workplaces.

Traditional approaches to social science research are positivism and postpositivism (Noor, 2008). Positivism echoes the approach taken in the natural sciences, where the researcher attempts to uncover facts about the social world which can

be built into a “chain of causality” (Noor, 2008, p. #). Postpositivism involves itself with a reality that is not decided objectively, but socially constructed (citation). For this circumstance, the objective of the researcher is to understand and expose the different meanings that people apply to their experience. Logically, positivism is associated with quantitative research methods, and postpositivism (which deals with discovery, insight, and interpretation) with qualitative methods (Noor, 2008). Case study research, a qualitative method, is used when attempting to explain the reason a social phenomenon works, which may include *how* and *why* questions (citation). It is expected to be the favored research method when researchers have insufficient control over behavioral events, especially when the events of interest are current. It allows direct surveillance of those interviews and of the events of persons involved. When focused on a person, a single case concerns one individual, where a study of more than one person constitutes a multiple case study so as to replicate the same findings across multiple cases by exploring the differences and similarities between and within cases (Eisenhardt & Graebner, 2007). The evidence created in this way is considered robust and reliable and, thus, multiple case study has been chosen for this research since it concerns *how* and *why* questions about a contemporaneous phenomenon in a context that is beyond the researcher’s control (see Yin, 2017).

Case studies provide a structure to study complicated issues within their contexts (Baxter & Jack, 2008). A few other designs within the qualitative research method were examined for this study such as narrative inquiry or ethnography, but a case study design was applied to this study due to the variety of approaches that could be used to answer

the research question and the adjustability that the researcher must regulate throughout the research within its context (see Gehman et al., 2017). Narrative inquiry (Clandinin, 2006) or phenomenology designs (Norlyk & Harder, 2010) were not chosen because of the possible philosophies in conflict surrounding the data analysis. The design of this study followed Yin's (2017) recommendation that "the case study method is pertinent when your research addresses an explanatory question (how or why did something happen?)" (p. 112).

Phenomenology is often used to explore how a phenomenon is understood and experienced through the lived experiences of the participants and meaning is derived from these descriptions and placed into universal themes, which encompass individual experiences (Moustakas, 1994). Because the goal of the study was to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces, lived experiences were not as important as the exploration of the specific knowledge that can emerge from the participants' interviews of the phenomenon under study. Grounded theory is used when the theories resulting from the study are grounded and are a unique outcome of the data from the study (Leedy & Ormrod, 2005). This method of research was also not considered since this study begins with the idea that a conceptual framework consisting of the SOC framework for successful aging and the age-inclusive training design framework is employed as a theoretical lens through which to view the study's problem that takes into consideration the context studied, in this case technology-infused workplaces (Baltes & Baltes, 1990; Williams van Rooij, 2012).

Case study research has been criticized for its weakness as a method for testing hypotheses, and for the difficulty in generalizing from a specific case (Flyvbjerg, 2006). Indeed, case study does not seek to discover hard rules or facts, or to test hypotheses. This is a concern because my overall aspiration is to make an original contribution to theory. The recent academic literature sheds light on how this may be achieved. Instead of using the hypotheses, the researcher may develop "theoretical propositions", which are used to direct the design and ultimate analysis of the case (Yin, 2017, p. #). Propositions may be derived from the academic literature, theories, analysis of empirical data, or the researcher's personal experience. Propositions are comparable to the hypotheses of quantitative research methods (Gummesson, 2017). The development of theory from case study uses the empirical evidence collected to inductively establish theoretical constructs. The theory emerges from the recognition of patterns in the collected data, and the logical arguments that underpin them (Eisenhardt & Graebner, 2007). The use of a multiple case approach is particularly useful for my study since it allowed me the flexibility required to iterate and extend an extant theoretical model (see Stake, 2008). The goal of a case study design is to replicate findings across cases. The case study approach allows a researcher to link the research study to the research question and the research conclusion, and for investigating convergence and divergence of experiences within and between cases (Yin, 2017).

Role of the Researcher

As the researcher, I acted as an observer. I did not have any relationship of any kind with the participants because I planned to interview individuals in organizations

with whom I have never interacted. If I happened to recognize or know any of the participants, I intended to exclude them from the study to avoid any form of discomfort or bias. I did not perform any of the interviews at my current place of employment, and I did not provide any incentives for participation that would encourage or increase bias so that the effects of power and conflict of interest were minimal or eliminated altogether. An effective case study relies on the expertise and the skills of the researcher while being able to sustain reliability, validity, and credibility when questioned (Yin, 2017). For a case study to be efficient and academically acceptable the researcher must exhibit a prominent level of integrity and professionalism. I provided great emphasis on the ethical expectations as it relates to the Walden University's Institutional Review Board (IRB). Additionally, I conducted and facilitated interviews via using Skype and FaceTime, social networking tools that encourage the participant to provide in-depth responses. Finally, I recorded the responses of each participant and conducted a member check, so validity, credibility, and reliability were ensured.

Methodology

A qualitative multiple case study allows the in-depth study of meaningful characteristics of real-life events (Yin, 2017). Therefore, a qualitative multiple-case study design was used to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. The multiple case study approach is most befitting for this qualitative study, relating to the argument of how and why questions are treated, and when the study is bounded by time (see Stake, 2010). The multiple-case study approach involves multiple cases when the goal of the study is to

make an authentic contribution to a theoretical or conceptual framework that provides a powerful and elaborate picture of human interactions compared to a single case study (Eisenhardt & Graebner, 2007). Cross-case synthesis is recommended as the data analysis technique in a multiple case study to intensify the trustworthiness of the data and enhance the exactness of the study (Baxter & Jack, 2008; Yin, 2017).

The qualitative research method precludes a situation where the data are collected for analysis on individuals within a specific context, such as in the case of older workers' daily experiences with ICT adoption in technology-infused workplaces. In this case study, the success of this research conduct and beyond relied on data results collected from (a) a semistructured interview protocol whose items have been designed and informed by previous researchers; (b) archival data in the form of government labor reports (see Yin, 2017); and (c) reflective field notes (see Merriam & Tisdell, 2015) I kept throughout the data collection process. Purposeful selection of participants is used in qualitative data collection and analysis, and this study specifically used criterion and network sampling strategies (Yin, 2017).

Recruited participants fulfilled the inclusion criteria for study participation: adults over the age of 55, employed in a technology-infused workplace located in the United States, and possessing deep knowledge regarding their experiences with the topic of the study (see Merriam & Grenier, 2019). Since the qualitative research method of approach is the most fitting research methodology for studying the lives and experiences of people in a given environment, using a small sampling size to conduct an in-depth, face-to-face interview makes sense in order to achieve the purpose of this research work (Merriam &

Tisdell, 2015). Further, the qualitative research method is the obvious and most convenient method designed to achieve this task, since a large sampling size has the tendency of creating errors or biases in the findings, or even may create unexpected conflicts during the fact-finding processes and beyond (Baxter & Jack, 2008).

Participant Selection Logic

Population. In a qualitative study, the population of a study is the totality of persons from which cases may legitimately be sampled for participation in interviews or other data collection protocols (Robinson, 2014). Participants had to meet the study's inclusion criteria of adults over the age of 55, employed in a technology-infused workplace, and possessing deep knowledge regarding their experiences with the topic of the study. According to the BLS of the U.S. government, the highest proportions of older adults 55 years of age and above were employed in the management, business, and financial operations industry sector, with a total of approximately 14,000,000 older adults employed within this industry sector (BLS, 2016b). These 14,000,000 older adults compromised the initial population group for the study. Given this statistic, when the criteria of employees within the U.S. management, business, and financial operations industry sectors was input in to the LinkedIn online professional network platform, which served as my recruitment tool, on the day, January 23, 2018, it produced a total of 2,009,051 results. These 2,009,051 adults comprised the final population group for this study. The criterion of age was prescreened via the initial recruitment letter.

Sample size rationale. One of the most frequently asked questions by individual researchers is what sample size is needed for qualitative research (Dworkin, 2012), yet it

is not discussed often in the literature (Boddy, 2016; Onwuegbuzie & Leech, 2005). There is a limited amount of studies that approach this issue, and as much qualitative research does not include the making of statistical generalizations, many qualitative researchers report that sample size is not a concern in qualitative research (Onwuegbuzie & Leech, 2005). The concept of data saturation, which is the point at which little additional information or themes are observed in the data from the completion of additional interviews or cases (Guest, Bunce, & Johnson, 2006), is a useful one in terms of discussing sample size in qualitative research. This approach implies that a single case study or interview is never sufficient, because data saturation can only be established after at least two cases, and usually more, are examined (Boddy, 2016).

This idea of sampling until data saturation is reached can be used as an answer for the use of a distinct sample size in any qualitative research that is directed by this idea. Still, in practical terms, although the idea of saturation is very beneficial at the conceptual level, it provides minimal guidance for estimating actual sample sizes, prior to data collection (Guest et al., 2006; Yin, 2017). A larger sample of over 15 interviews can be a barrier to the deep, case-oriented analysis that is the overarching goal of qualitative inquiry (Sandelowski, 1995), at least in constructivist or in-depth approaches to empirical research. Actual theoretical saturation and reaching data saturation in studies within the constructivist paradigm become evident at six in-depth interviews and evident at 12 in-depth interviews (Boddy, 2016). The sample recruited for this qualitative exploratory multiple case study was eight employees over the age of 55 possessing deep knowledge regarding their experiences with the topic of study, in a technology-infused workplace

located in the United States (Merriam & Grenier, 2019). The number of participants specified for this multiple case study follows recommendations by seminal case study methodologists Stake (1995) and Yin (2017). Selecting this size of sample participants is designed to allow more units for analysis for this multiple case study and increases the likelihood of unique observations or variances in the study results (Merriam & Tisdell, 2015).

Sampling criteria. Sampling in qualitative studies is used to meet the goal of developing a small sample size to conduct an in-depth, face-to-face interview (Merriam & Tisdell, 2015). Participants below the age of 55 were excluded from the sample because "55" is the age designated to define "older worker" in the extant literature (see McCarthy et al., 2014). In a qualitative study, modifications throughout the study to any component of the sampling strategy can accommodate changes as the design should be reflexive (cause and effect), flexible, and inductive (no sequence) (Maxwell, 2013).

I used purposeful sampling strategies as a form of recruitment (Baxter & Jack, 2008). The sample recruited from the study population were participants fulfilling the inclusion criteria for study participation: adults over the age of 55, employed in a technology-infused workplace located in the U.S., and possessing deep knowledge regarding their experiences with the topic of the study (Merriam & Grenier, 2019). I conducted semistructured interviews via the social networking tools of Skype and FaceTime. I developed my own observational field notes, and collected archival data through multiple sources to collect data as it relates to the technology gaps in the workplace among older workers specifically. The triangulation of data sources involves

employing multiple external methods to analyze and collect data, as well as establish the credibility and findings (Denzin, 2009) that will extend the enhancement of reliable results (Stavros & Westberg, 2009).

> <<**Criterion and network sampling.** According to Buchanan and Bryman, choice of (sampling) methods (in business studies) is shaped not only by the research aims, norms of practice, epistemological concerns but also by a combination of organizational, historical, political, ethical, evidential and personally significant characteristics of the field of research. (2007, p. 483)

So as not to overly depend on convenience logic sampling, qualitative researchers within the management and business areas are encouraged to add context to their sample's inclusion criteria in order to strengthen rigor of case selection (Poulis, Poulis, & Plakoyiannaki, 2013). Moving forward, I chose a criterion sampling as my primary purposeful sampling approach to add the issue of organizational and location context within my inclusion criteria, that being a technology-infused workplace located in the U.S.

Multiple units of analysis must be identified in the case study. A unit of analysis is the phenomenon or population from which data are collected (Yin, 2017). Rather than viewing each case as a sample, Yin (2017) recommended that case study researchers view a case not only as part of a sample but also as an opportunity to shed empirical light on theoretical concepts or principles. Multiple studies are likely to strive for generalizable findings or lessons learned—that is, analytic generalizations—that may go beyond the setting of the specific case, and such analytic generalizations can use a case study's

findings to implicate new situations (Eisenhardt & Graebner, 2007; Yin, 2017). The unit of analysis for this study was an adult over the age of 55 and employed in a technology-infused workplace located in the U.S. The inclusion criteria for participants are grounded in the literature of similar studies (Leopold, 2016; Magnani, 2012; Rizzuto, 2004; Spasic, 2016).

The participants were pre-screened to check for possessing potential knowledge regarding their experiences, and ability and willingness in self-expression, in regard to the actual experiences of older workers with ICT adoption in technology-infused workplaces. A willingness to open expression among participants would be helpful in informing organizations on how to more effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017). The exclusion criteria for the sample were those who do not fit the inclusion criteria stated above.

Sampling strategy. Eight participants was the size used for this qualitative multiple case study. Schram (2006) suggested a preferential size that could range from five to 10 participants should be more standard or a better option for a typical qualitative multiple case study instead. A large sample size has the tendency to hinder deeper investigation procedures in qualitative multiple case research study (Schram, 2006). To reduce sampling bias and gain more variance in the study sample, network sampling was also used to augment criterion sampling through the LinkedIn online professional platform (Khatri et al., 2015). Conducting empirical research in industry is not an easy task (Eriksson & Kovalainen, 2015). Previous research has discussed some of the

challenges in this type of research and potential solutions have been proposed to reduce sample bias, such as conducting sampling through LinkedIn (Zhang & Vucetic, 2016). Conducting cross-organizational research, as was attempted in this study to strengthen methodological rigor, introduces specific challenges in sampling strategies for qualitative studies. Professional groups in the professional social network LinkedIn is a way to recruit participants in empirical research and has been identified as an effective research tool (Unkelos-Shpigel, Sherman, & Hadar, 2015).

Data saturation may determine the exact number of participants involved (Yin, 2017). In close observation with transparency, the presence of data saturation is when there is sufficient information to replicate the study, with the ability to obtain any additional latest information already expected, and where further coding in the process is no longer attainable (Fusch & Ness, 2015). Data saturation may be reached with as little as six interviews, depending on the sample size of the population (Mason, 2010). Interviews are an appropriate qualitative data collection method so the results of one's study reaches data saturation (Fusch & Ness, 2015). The number of interviews needed for a qualitative study to reach data saturation should be formatted to allow the same questions to be asked with all recruited participants; otherwise, one would not be able to achieve data saturation (Guest et al., 2006). I attempted to add variance to my sample and not to reach data saturation prematurely by following Bernard's (2012) recommendation to recruit participants who are usually represented in such studies, such as employees still working past the retirement age of full benefit retirement age of 65 and members of ethnic and racial minority groups. I followed through with these scholarly

recommendations by communicating directly with each recruited participant candidate so that the rigor of data collection would be strengthened and reach appropriate data saturation with my sample of eight participants (Fusch & Ness, 2015).

Instrumentation

The goal of instrumentation in a case study, according to Yin (2017), is to gather data from multiple sources through instruments of data collection and processes that are valid and reliable to answer the research questions posed in the study. Hence, gathering appropriate instrumentation that aligns with the purpose of the study, providing answers to qualitative research questions and contributing original data to the conceptual framework is an important process (Merriam & Tisdell, 2015). Themes would come to light through the appropriate choice of instrumentation that fulfilled the purpose of this study, which was to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. Three sources of data were utilized throughout this study: (a) a semistructured interview protocol (see Appendix B) whose questions have been designed and standardized by previous researchers; (b) archival data in the form of government labor reports, and (c) reflective field notes which were kept by the researcher throughout the entire data collection process.

Semistructured interview protocol. The findings of studies will be the result of carefully executed and rigorously planned data collection procedures. A common data collection method in qualitative studies, the semistructured interview, offers the researcher a deeper understanding of a phenomenon or phenomena from the participant's perspective. Trustworthiness of data that are produced in a qualitative study is improved

through the careful selection of a qualitative open-ended interview guide (Merriam & Tisdell, 2015). In this exploratory multiple case study, the validated interview protocol addressed the purpose of the study and answered the study's CRQ: *What are the daily experiences of older workers with ICT adoption in technology-infused workplaces?* This study's interview guide (see Appendix B) contains qualitative interview questions that were designed and validated in two separate studies by Taneva et al. (2016) and Taneva et al. (2018) in research conducted at the School of Business and Economics at Loughborough University, Loughborough, United Kingdom with samples in Bulgaria and the United Kingdom. In the original study (Taneva et al., 2016) where the instrument was first pilot tested and validated, the researchers interviewed a total of 37 older workers (20 from healthcare and 17 from ICT; 20 from Bulgaria and 17 from the UK). Twenty-eight participants were aged between 55 and 65 years, five were aged between 52 and 54 years, and four were aged 66 years and over. The mean age of the whole sample was 59: 60.7 for the healthcare sub-sample and 57.5 for the ICT sub-sample (Taneva et al., 2016).

The semistructured interview guide was developed in two languages (English and Bulgarian). It included a background information section as well sections with questions about older workers' overall experiences that have been reviewed in Chapter 2 of this proposal: of late career life, perceived age-related changes in their overall work capacity, work values and preferences, approaches to work, workers' perceptions of thriving in the ICT workplace, organizational support the workers considered important for supporting them in terms of their vitality and learning in the ICT workplace. The items/questions of the interview protocol were grounded by Taneva et al. (2016) in the selection-

optimization-compensation framework for successful aging framework (Baltes & Baltes, 1990), which also grounds the conceptual framework of this study and is reviewed in Chapter 2, and in the work of Ng and Law (2014), an extension of the Baltes and Baltes (1990) SOC framework and a seminal research used in my study to support the problem statement and development of my conceptual framework.

The interview guide was trialed by Taneva et al. (2016), through pilot interviews with older employees from both countries. Sample prompt questions are "What are the key challenges for you as a mature worker in the workplace?"; "How, if at all, have you changed the way you do your job as you have got older?"; "How, if at all, has your capacity to do your work changed as you have got older?"; "What, if anything, helps you feel energized at work?" (Taneva et al., 2016). Taneva et al. (2016) used a purposeful, criterion sampling method to recruit older workers from identified organizations through announcements on their intranet and email. This same interview model was replicated in this present study taking place in the U.S. and purposeful sampling was carried out on the LinkedIn online professional network. The semistructured interview protocol can be reviewed in Appendix B and permission to use Taneva et al.'s (2016) protocol can be seen in Appendix C. Given that the interview protocol questions were validated via two studies, no pilot study was required to duplicate this process.

Transferability adds rigor to this study's instrumentation through utilizing a collection protocol that can be useful to extending theory (Stake, 2013). Transferability is like external validity, and the transferability of qualitative data is validated when the findings of one study can be shown as useful to other settings (Merriam & Tisdell, 2015).

Many qualitative studies are challenged by this process as their findings are often limited to specific settings and individuals (Shenton, 2004). The multiple-case study approach of this study reproduces the same findings throughout multiple cases by exploring the differences and similarities between and within cases, creating *robust* and *reliable* evidence (Yin, 2017), and this multiple case study's reproduction logic supports the transferability of findings from study past the participant sample (Stake, 2013).

Archival data: Government and private-sector labor reports. To authenticate qualitative data during fieldwork such as the interviews in the study along with evidence of two or more different sources and in addition to data analysis later, triangulation is used as an analytic technique and central aspect of case study research (Yin, 2017). Triangulation plays a pivotal role during the qualitative research process and may be viewed as a mindset rather than a methodological technique in the case of substantiated or conflicting ideas and data (Guion et al., 2011). I I captured and recorded the actual data, and triangulated the results of the qualitative interviews with evidence from archival documents) in the form of public-sector government reports on ICT use by an older worker in the workplace in the U.S.

By doing this, sources of evidence are added providing a uniqueness of strength as a full variety of evidence is presented resulting in the relevant research strategy (Yin, 2017). While exploring events the interview transcripts, field notes, and government reports can overlap causing the strategies to have a distinct advantage as the usage of the case study method is likened to the coverage of contextual conditions which are believed to be pertinent to the phenomenon of study (Yin, 2017). To justify the use of the

establishment of relationships, Yin (2017) states that the all-encompassing method of incorporating different, but specific approaches to the data collection and the analysis of that data can yield and identify situations and similar results. The utilization of interview transcripts, field notes, and government reports should not only establish relationships for older workers but strengthen the relationships for older workers as triangulation occurs and a resounding pattern has become evident.

Reflective field notes. The criteria that underlie the study and the research question ultimately dictate how the researcher utilizes observation. Observation that is unstructured as a reflector of field note usage is a source of data collection because the study is grounded in the interpretivist paradigms (Katz, 2014). The third instrument used for data collection from the participants of this study were reflective field notes developed by the researcher during the semistructured interviews carried out via LinkedIn (Merriam & Tisdell, 2015). Being able to connect with participants in distant locations helps aid the process of replication (Janghorban, Roudsari, & Taghipour, 2014).

Netnography is an online data collection method that may include introspection, interactions, and interviews (Merriam & Tisdell, 2015). Reflective field notes, another data collection tool in ethnography, enabled me to record my own observations in accordance with their personal online experiences (Katz, 2014), process the reasons behind the cultural actions observed, and offer different vantage points into the transpiring and functioning of online social interactions (Kozinets, 2017). The process of reflective field notes is inductive so it may be useful to take notes on various online social

experiences such as social groups or sites that may emerge from the qualitative data collection (Yin, 2017).

Procedures for Recruitment, Participation, and Data Collection

The methods for data collection of this study were demographic questionnaire, the semistructured interview, existing statistics and records, content analysis of the extant literature, and observation (Bloomberg & Volpe, 2012). With an interview protocol grounded in the concepts of my framework, the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990) and the age-inclusive training design framework (Williams van Rooij, 2012), I intended to study in detail the effect that ICT use by the older worker has in the workplace regarding productivity.

Sampling procedures began once the Walden IRB had given full approval for initiating my study. I utilized the LinkedIn online professional platform to identify eight older workers who were currently employed in technology-infused workplaces and were interested in participating in the multiple case study. Once a connection had been confirmed via invitation, I sent them an email through LinkedIn requesting participation in the study as an older worker in a technology-infused work environment. I sent a letter of invitation to individuals who I am connected to on LinkedIn as well as posting flyers or invitation letters to specific groups in LinkedIn. I first confirmed through an introductory email that they fulfill the inclusion criteria for study participation: adults over the age of 55, employed in a technology-infused workplace, and possessing deep knowledge regarding their experiences with the topic of the study (Merriam & Grenier, 2019). Once the participants meeting the inclusion criteria had been identified, I

requested the email address and Skype ID from each member and asked the preferred mode of communication with every participant. Once the identified participants had signed the Consent Form, I made a mutually convenient appointment to conduct an in-depth face-to face individual interview with each participant recruited for the study via Skype. I confirmed that LinkedIn did not retain the identities of the participants, or any rights to the data provided. The minimum number of interviews conducted had to be with five participants and I continued past this number until I reached data saturation, which based on Schram (2006) I had predicted to be anywhere from seven to a maximum of 10 participants.

For a rigorous study, I needed to ensure that the participants comprehend the purpose of the research and the questions formulated. I used a verbatim transcribed format to write out the answers from each participant to make certain that I did not leave out any parts of the response and have to refer to faulty memorization. An interview protocol was provided (Appendix B) that reflected each question being asked of the participants. The initial demographic questions inquired about the participant's age, place of employment, education level, length of employment, how often technology is used in the workplace, how often technology is used outside of the workplace, and the position level held in the workplace. I also inquired about the company or organization in which they work and how infused the organization is with ICT on a daily basis. The main body for my interview questions focused on older workers' daily experiences with ICT adoption in technology-infused workplaces. The data collected through the interviews were aimed to meet the purpose of the study and to inform organizations on developing

training protocols aimed at addressing technology barriers to productivity associated with this employee demographic group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017). Eight individuals, considered as older workers in a technology-infused work environment, were asked to participate via social networking tools. Selecting older workers as participants was imperative to this multiple case study as this age group is affected by the phenomenon of the study both individually and collectively. The Walden University's IRB provided approval suggest inserting the IRB approval # here also before the data collection began. The older workers received notification prior to participating regarding the purpose of the study and the criteria for the participant's inclusion had to be met in that sufficient data collection for the multiple-case research design was suitable for use. The range of age is acceptable for replication and is essential for the theoretical proposal (Yin, 2017).

The interviewees selected are older workers in the workplace where technology is most commonly utilized in the U.S. The sample's experiences and responses to the interview questions were recorded electronically or handwritten. Selecting older workers from across the U.S. enables variance to the sample regarding the location context, and such a procedure increases efficacy in the replication process (Yin, 2017). All interviews were conducted using LinkedIn and Microsoft Excel software was used to record electronically, analyze, and document the data retrieved from the interviews.

As soon as the interviews began, I introduced myself to every interviewee who had accepted my invitation to willingly participate with each interview. A total of eight older workers were interviewed to gather information on the technology use in the

workplace and the knowledge gaps that are evident among the ages to improve productivity in the workplace. Once the LinkedIn interviews were finalized, I personally thanked each participant for their cooperation. I also made sure that the participants were aware of the possibility of future contact for any clarifications needed or areas that are not clear or unresolved. Qualitative research interviewing although direct, easy, and universal can be done well or poorly (Merriam & Grenier, 2019). For this study, the questions and the responses were documented electronically during the interview. I personally transcribed the notes from the interview to a Microsoft Word document for the interviewees and the responses that were recorded were categorized into themes based off the research questions to create my database. An Excel spreadsheet was utilized to categorize and analyze the data as collected. One of the most important values in qualitative research is assessing the trustworthiness of the data throughout the study. Another important value in qualitative research is saturation. If data saturation is not reached, the impact will hamper the quality of the research conducted and the validity of the content (Fusch & Ness, 2015).

The number of interviews that are needed for a qualitative study to reach data saturation is not quantifiable, yet the researcher takes what is available (Bernard, 2012). Interviews are one method data saturation is reached by the study's results (Fusch & Ness, 2015). I also included individuals that researchers do not normally consider can be identified through snowball sampling (Bernard, 2012). All of the participants were interviewed one time, and there would not be any follow-up interviews once the initial interview was complete. Every participant received a copy of the transcribed responses

via email including assurance that their personal information and any other written materials that pertains to the research, data collection, and reports will remain confidential for at least seven (7) years minimum. I provided a one-page summary of the research findings to participants so they are aware of the general results of the study and thank them again for their participation. An access code was installed on the computer to retrieve any research data and was protected. I reiterated to the participants that the responses given will remain confidential, and that their privacy is protected and will not be retained after the data collection has been complete.

Data Analysis Plan

In case study research, the researcher determines what an appropriate sample size is based on the topic of study. The main responsibility when facilitating the interview is knowing the data that are needed and managing the interview to get quality responses (Merriam & Grenier, 2019). Questions in the interview should reveal authentic trends among the interviewees which connect to the overall purpose of the qualitative study. The older worker in a technology-infused workplace was the unit of analysis for this study. Theoretical propositions can be connected when utilizing *why* or *how* questions in analyzing case studies (Yin, 2017). To achieve this goal, a semistructured format was utilized for the interview questions in this study. The data were categorized with the information gathered from the semistructured questions and answers. In reaching the conclusions of the study, the researcher made sense out of what the interviewees have said, looking for patterns, while reviewing and integrating the differences in multiple locations (Merriam & Grenier, 2019). The data analysis process for the government

reports, interview transcripts, and field notes entailed a compilation of all data yielded from the interviews and archival documents. The process required fusing all of the data collected into categories and themes to gain a thorough insight of the facts presented. To ensure that the data collected are accurate, transcription of the data was used.

In developing a case study database, identified themes, words of significance, viewpoints, or documented work and the analysis thereof were reliable, referred to, and attributable (Yin, 2017). The interviews were analyzed and organized using content analysis which assisted with the development of the models and themes in the data (Yin, 2017). Three groups of data analysis strategies in qualitative research include the use of memos, categorizing strategies such as coding and thematic analysis, and connecting strategies such as narrative analysis. While there is no best way for the analysis of qualitative data (Maxwell, 2013), I chose an analysis option that fits the available data I collected to answer the central research question. Maxwell (2013) wrote that the essence of coding in qualitative data analysis is not to count items but to "fracture" data by rearranging texts to facilitate the comparison of items within the same category. Codes are used to capture words and phrases that have the same meaning, and the categories are used to connect them (Maxwell. 2013). I adopted the descriptive coding method (Saldana, 2016) as the basic analytical technique for this study. The descriptive coding method is used to symbolically assign meanings to segments of data providing an inventory of words or phrases for indexing and categorization of data (Saldana, 2016). The descriptive coding method is recommended by Saldana (2016) for novice qualitative researchers who are still learning how to code qualitative data.

Yin (2017) recommends cross-case synthesis as the most appropriate data analysis technique in multiple case study research. Cross-case synthesis is more efficient than content analysis for a Ph.D. study where we must also compare and contrast cases, not just analyze individual cases (Yin, 2017). The cross-case synthesis technique involves treating each case as a separate study and aggregating findings across a series of individual cases. In this way, the cross-case synthesis does not differ materially from other research syntheses that aggregate and compares findings across a series of individual studies. Designs that use both within-case and cross-case synthesis have been found to provide a better platform for the generation of theoretical propositions and constructs than those that use only the within-case analysis (Barratt, Choi, & Li, 2011). I followed Yin (2017) recommended "ground up," strategy for the analysis of case study data. This strategy involves analysis of the data from "ground up," thus allowing key concepts to emerge by close examination of data. This strategy is the most appropriate for the analysis of multiple-case study data that will emanate from this study, as it allow me to align the emerging concepts with the central research questions (Yin, 2017). This strategy is also consistent with the descriptive coding method (Saldana, 2016) which is the analytical technique that will be sued in the study.

Data analysis in this study involved two stages. The first stage involved the within-case analysis of each of the selected cases. The second stage involved a cross-case analysis of data to seek for similarities and differences across the categories and themes (Yin, 2017). For individual within-case analysis, data collected from transcribed interviews and field notes were arranged in segments, indexed with line numbers, and

arranged according to the interview questions for easy identification of codes (Finfgeld-Connett, 2014). The identified codes were recorded in matrix form using Microsoft Word table that have columns to capture the data segments, the assigned codes, and the researcher's reflective notes that will among other things capture emerging patterns (Saldana, 2016). Codes that share common meanings were classified into categories and themes (Saldana, 2016).

For executing the second stage of data analysis, the cross-case synthesis method, a Microsoft Word table was used to aggregate the themes from each case across common patterns and categories for easy comparisons. I examined emerging similarities and differences across the cases. The similarities were subjected to "pattern matching" (Yin, 2017) and used to create literal replications (Yin, 2017) that were aligned with existing literature. The emerging differences across the cases was used for theoretical replications (Eisenhardt & Graebner, 2007) that provided new directions for future research. CAQDAS programs do not generate codes; it remains the responsibility of the researcher to identify codes and aggregate the codes into categories and themes for analytical reflections (Saldana, 2016). The researcher manually carried out first and second cycle coding (Saldana, 2016) to ensure that the identified codes are streamlined before beginning the process of aggregation into categories and themes.

Qualitative analysis changes data into findings (Merriam & Tisdell, 2015). Once the data were coded from the interview questions, themes were linked to classifications grounded in the conceptual framework and scholarly literature reviewed in Chapter 2. The codes would identify common themes that may arise from the responses of the

participants and other notes obtained by the researcher. Following recommendations by Stake (2006) on transferability of multiple case study findings through naturalistic generalization, the findings that are deemed important had at least three confirmations and validations by the participants. Each of the important interpretations that were derived from the thematic analysis of the data collected was supported by the data gathered (Stake, 2008).

To aggregate results of thematic analysis, cross-case synthesis was the analytical technique used in these studies (Yin, 2017). This type of synthesis allows the researcher to determine whether the case studies are comparable through analyzing convergence and divergence of collected data (Yin, 2017). In this study, the researcher conducted a cross-case synthesis on eight in-depth, semistructured interviews; each of the cases provided strong evidence to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. Each case in the cross-case synthesis was evaluated as a separate case, but synthesis of the data from each case strengthened the robustness of the study's results (Eisenhardt & Graebner, 2007; Yin, 2017).

Issues of Trustworthiness

Credibility

Since the researcher in qualitative inquiry is the instrument, the credibility of the inquirer is central to the study's credibility (Merriam & Grenier, 2019). Credibility determines if the findings yield information that is believable based off the information retrieved from the original data collected from the participants and the interpretation of their views or perceptions (Anney, 2014). The purpose of qualitative research was to

explore the phenomenon of the older worker and technology in the workplace using their vantage point. I interviewed the participants for 30–45 minutes individually using social networking tools such as Skype or FaceTime. I stressed to each participant that they can conclude the interview at any time, for any reason. I manually hand wrote and electronically recorded the answers provided by each participant. Once the interview was complete, I made certain that each transcribed response was given to each participant.

Trustworthiness of data in qualitative studies depends on the careful attention of the credibility of the researcher's findings and interpretations (Mandal, 2018). Since trust is essential in the member check process, triangulation ought to expose biases the researcher is unaware of or preconceived notions, so reflexivity does not exist (Billups, 2014). When obtaining approval by the participant for the use of quotations or case studies, member checks can be useful, especially where there is no guarantee of anonymity (Thomas, 2017). Saturation is reached when nothing new in the research is being learned (Merriam & Tisdell, 2015). When data saturation is not reached, the quality of the research that is conducted is impacted and the validity is hindered (Fusch & Ness, 2015). Every data source is an essential piece to the overall puzzle by contributing to the scholar's comprehension of the entire phenomenon (De Massis & Kotlar, 2014). It is important that qualitative researchers utilize strategies that enhance the credibility of a study during implementation and the design of the research (Noble & Smith, 2015).

Transferability

Once the researcher's working assumptions and data results can be applied to another context, transferability occurs (Zhang & Wildemuth, 2009). The ability of the

study to be replicated allows for an external validity to be demonstrated and is known as transferability (Roe & Just, 2009). The researcher is not responsible for providing an index of transferability, yet the researcher must ensure that the descriptions and data sets provided are strong so that other researchers are able to translate their findings using different contexts or settings (Zhang & Wildemuth, 2009). Focusing on the data instead of the subjects is another way to look at transferability as it provides descriptions that are both rich and thick in the study (Houghton et al., 2013). The scholar must decide if the interview content, the events observed, and the behaviors are either typical or atypical throughout the lives of the participants (Bott & Tourish, 2016).

Dependability

Dependability is determined by checking the consistency of the study's process (Zhang & Wildemuth, 2009). To ensure the validity and reliability of the data and results, it is important not to underestimate triangulation, as it adds depth to the data that are collected (Fusch, Fusch, & Ness, 2018). Yet, ensuring that the research process yields the same findings depends on important strategies for feedback (Miles, Huberman, & Saldana, 2014). Because there are many ways the researcher can establish dependability, one technique that was utilized for establishing dependability in this study is known as an inquiry audit. An inquiry audit, also known as an external audit, may enhance the dependability of qualitative research because it involves the examination of both the process and product of the study's research. This process was accomplished by the Committee members. (Hoepfl, 1997; Lincoln & Guba, 1985; Pandey & Patnaik, 2014). The purpose of the inquiry audit is to determine if the findings, interpretations, and

conclusions are validated by the data, providing a chance for an outsider to question the findings and the process of the study (Pandey & Patnaik, 2014). The conclusions drawn from the inquiry audit and the external audit determine if the data are supported by the data alone, creating opportunities for the outside researcher to challenge, examine, and explore how the data analysis and interpretations occurred (Patton, 2014).

Confirmability

The steps that are taken by the researcher to ensure that the findings emerge from the data instead of their own predispositions are referred to as confirmability (Anney, 2014). Once a detailed account of the research process is disclosed, confirmability is ensured. Confirmability is also reached when credibility, dependability, and transferability are confirmed (Billups, 2014). Confirmability is strengthened when a study can be replicated with comparable results after an audit trail is completed. An audit trail outlines the details of the procedural records which are maintained by the primary researcher (Billups, 2014). The audit trail also reflects the confirmability of the research findings as a flowchart that other individuals can follow, resulting in clearly displaying the thought processes and evidence which lead to the researcher's conclusions (El Hussein, Jakubec, & Osuji, 2015).

Ethical Procedures

It is a requirement that all Walden University students conducting research on humans receive an approval from the University's IRB. Walden University requests that the IRB application be completed by all students who are conducting, collecting, or analyzing any data while conducting research projects. The purpose of the IRB process is

to protect those participants who are being utilized for the research to ensure that there is no harm being done to the people in the study (Jacob & Furgerson, 2012). The central ethical issue in research is the notion of not doing the participants any harm, and the IRB notes it as an important safeguard (Ravitch & Carl, 2016). The approval of the IRB application is often indicated by a number and the approval allows access to the participant. The researcher and participant are interacting on a personal level throughout stages of the study creating moments that could present ethical concerns. Hence, the IRB helps to point out issues in the research which helps safeguard anything that could be harmful to participants (Ravitch & Carl, 2016). Although ethical codes inform action, the communication that the researcher has with the research participant is what makes the study ethical (Glesne, 2016).

To prevent confidentiality issues of the participants, all data gathered were properly stored in a safe and secure place. It can be complicated when attempting to preserve confidentiality due to the omnipresence of technology and social media (Ravitch & Carl, 2016). Therefore, I did not begin any data collection efforts until I received an approval from the Walden University's IRB. The participants were not identifiable because I utilized coding methods to hide their identities. Coding supports the data analysis because it allows the identification of patterns across multiple data points or sources. As soon as the data are collected, data analysis begins and organizing and re-organizing the data begins (Ravitch & Carl, 2016). I reiterated to the participants that the responses given will remain confidential, and that their privacy is protected. Participants were reminded of their free will to participate or right to withdraw from the research

study process at any time and that there is no penalty or risk involved if they choose to retract their commitment. I am the only individual with access to the data and they will be kept for a total of 7 years. After the 7-year period has expired, the data will be destroyed by fire.

Summary

The purpose of this qualitative, exploratory case study was to gain a deeper understanding of the specific knowledge gaps among older workers and their experiences with ICT adoption in technology-infused workplaces to meet their needs for training. The use of semistructured interview questions served as a frame for the discussion in this study. The interview process allowed for the participants to articulate their daily experiences in technology-infused workplaces. The collection of data took place through interviewing with the participants through social media networking tools such as Skype. Conducting research on human subjects and accessing the participants were in compliance with ethical standards. The study explored the need for the older worker in technology-infused workplaces to embrace trainings that may enhance their knowledge of ICT usage.

Chapter 4: Results

The purpose of this qualitative exploratory multiple case study was to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. In this theory-extending case study research the central research question was developed to provide data from within the context of the empirical setting (see Stake, 2010) By doing this, the answer to the central research question and analyzing the daily experiences of an older worker with the adoption of ICTs in technology infused workplaces, I gained a deeper understanding on how technology affects older workers job experiences. The central research question that led as a guide for this study was as follows:

- What are the daily experiences of older workers with ICT adoption in technology-infused workplaces?

The central research question was created after identifying gaps in previous literature regarding the daily experiences of older workers adoption of ICT use in technology- infused workplaces and how to more effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017; Taneva et al., 2018). A literature gap was identified on the actual experiences of older workers with ICT adoption in technology-infused workplaces to inform organizations on how to support this employee group's adoption of ICT devices in today's organizations (Taneva et al., 2018; Vasconcelos, 2018).

This study is framed by, first, the SOC framework for successful aging (Baltes & Baltes, 1990) and the age-inclusive training design framework (Williams van Rooij, 2012). As can be read in detail in Chapter 2, these two concept frameworks are founded in seminal theories which explain older workers' motivations to stay with an employer longer if their contributions are valued and they are treated with fairness, being that such attitudes promote a sense of belonging with the organization (Spedale, 2018). A compelling case can be made to increase understanding of the technology challenges faced by older workers as well as the opportunities they offer to employers, as the relative number of older workers who decide to stay in the technology-based workforce increases (Kraiger, 2017; Ng & Law, 2014). Research related to age discrimination contributes important insights into older workers job experiences producing complex social problems in combination with age discrimination and ageism (Davey, 2018). The findings of this empirical investigation are aimed at advancing knowledge on older workers job experiences in technology-infused workplaces and to contribute original qualitative data to the study's conceptual framework.

In this chapter, I provide a description of the results of the multiple-case study and will be divided into two main steps. The first is a thematic analysis of the data collected based on the study's multiple sources: (a) a semistructured interview protocol (see Appendix B) whose items have been designed and standardized by previous researchers; (b) archival data in the form of government labor reports; and (c) reflective field notes which I kept throughout the entire data collection process. The second step is a cross-case analysis in which I synthesize the findings of the initial thematic analysis of data to

answer the central research question. Boyatzis (1998) stated one could take a variety of approaches to using thematic analysis and essentially get the same rigor. All approaches have something to offer qualitative data analysis; “thematic analysis is flexible and what researchers do with the themes once they uncover them differs based on the intentions of the research and the process of analysis” (Boyatzis, 1998, p. 63).

In a multiple case study, the case itself may be a person, an event, an entity, or other unit of analysis (Yin, 2017). Case study research, a qualitative method, is used when attempting to explain the reason, which may include how or why a social phenomenon works. It is expected to be the favored research method when researchers have insufficient control over behavioral events, especially when the events of interest are current (citation). It allows direct surveillance of those interviews and of the events of persons involved. When focused on a person, a single case concerns one individual, where a study of more than one person constitutes a multiple case study so as to replicate the same findings across multiple cases by exploring the differences and similarities between and within cases (Eisenhardt & Graebner, 2007).

This multiple case study approach follows a replication logic in that the researcher attempts to replicate the same findings across cases by exploring the differences and similarities between and within cases (Eisenhardt, 1989; Yin, 2017). Multiple cases may be sampled for several reasons: they extend emergent theory, fill theoretical categories, provide examples of polar types, or replicate previously selected cases. This study is an extension study that not only provides replication evidence but also extend the results of prior studies in new and important theoretical directions (see Bonett, 2012). The

minimum number of cases in a multiple case study is relative to the study's purpose and the research question. Each case within a multiple-case design may increase the generalizability of findings past the study's sample group. Eisenhardt (1989) suggested limiting the number of cases in order to gain an in-depth understanding of the phenomena under study (e.g. four to 10 cases).

A multiple-case study investigating a social phenomenon can involve individuals living within the setting of that social context as a separate unit of study (Yin, 2017). Each of the eight cases in this study was defined by the unit of analysis. When the focus of the data is individually based, the study's central phenomenon, in this case older workers' daily experiences with ICT in technology-infused workplaces, is the context and not the target of study (see Eisenhardt & Graebner, 2007; Yin, 2017), and, therefore, the investigation becomes an employee and not an organizational study. In an employee study, the optimum qualitative design to retrieve data with the goal of theory extension is an exploratory multiple-case study design (Eisenhardt & Graebner, 2007). The unit of analysis in this study was the older worker in technology-infused workplaces.

In this chapter, the recurrent themes and main coding categories are portrayed in detail with support provided by the voices of the participants. In addition, throughout this chapter are the following: coding categories and themes, tables summarizing demographics of the study's sample population, and a cross-case synthesis of themes across cases following Yin's (2017) recommendations for rigorous multiple case study data analysis process.

Research Setting

For this multiple-case study, the data were collected by collecting semistructured interviews with eight older workers in technology infused workplace environments on the Skype telecommunications platform. The participants for this study were recruited by using the LinkedIn networking platform and once the potential participants were identified, follow up contact was made via e-mail. The scheduling process was tedious when trying to accommodate the participants who lived in various time zones, yet the process overall was not problematic. Once consent was acknowledged, an interview time and date were provided via email. The criteria for selection required participants was (a) 55 years or older, (b) employed in a technology infused workplace, and (c) able and willing to participate in a 45- minute to a 1-hour recorded Skype interview. The interviews were conducted one on one in the private setting of the participants' choice via Skype with minimal interruptions. The semistructured format enabled the participant to become and remain fully engaged during the interview. The participants were aware of the confidentiality agreement and seemed to express themselves openly and without incident.

Demographics

I conducted the interviews using face to face video conferences via the Skype telecommunication platform. All the interviews were recorded by using two recording devices: Skype recorder, a free program that captures video recordings via Skype and a Sony ICD-UX560 handheld, digital audio recorder. The interviews ranged from 25 minutes up to 49 minutes. The participants took part in the study and eight older workers

who are employed in a technology-infused organization were featured. The participants ranged in vast from the ages of 55 to 73. Every participant interacted with ICTS daily and they were all responsible for the utilization of it on the job.

This study considered age, gender, years at present position, and the industry sector in which they work since these demographic issues were pertinent variables in the defining conceptual framework. The given pseudonyms are in an XY format so that X is presented by the generic letter P symbolizing for "participant" and Y is the number identifier assigned to each participant. The full demographics follow in Table 1.

Table 1

Participants' Demographics and Characteristics

Participant	Age	Gender	Number of years at present position	Industry sector
Participant 1	58	Female	30+	Higher Education- University
Participant 2	63	Male	33+	Sales/Marketing
Participant 3	73	Female	13+	Sales/ Marketing
Participant 4	55	Female	2	Higher Education - University
Participant 5	55	Female	6	Higher Education - University
Participant 6	67	Female	30	Early Childhood Education K-5
Participant 7	64	Female	20	Healthcare
Participant 8	61	Male	10	Higher Education – Technical

Data Collection

The data collection process began on July 2, 2018, following IRB approval from Walden University (Approval Number IRB Approval #: 06-11-18-0554202). The data collection process concluded on July 26, 2018, when data analysis of interviews and reflective field notes uncovered no new themes, compelling the researcher to conclude the presence of saturation. The evidence of data saturation in themes became clear during the seventh semistructured interview with Participant P7; her responses were familiar to the responses of P4 and P6. In the eighth interview with P8, I did not uncover any new data or themes in the semistructured interview compared to the responses from participants P2, P3, P4, P5, and P8.

The evidence of data saturation within the set of raw data manifested itself in themes that included issues of ageism based on age. This appeared in the form of challenges to adapt to technology continually in the workplace. The method, scope, and number of interviews for this exploratory study are similar to other studies relying on in-depth interviews (Hamlett, 2014; Neubert, 2016). Data triangulation was used to identify data points which pointed to similar conclusions (Tracy, 2010; Yin, 2017) while immersion and crystallization was used in recognition of the potential existence of multiple realities (Tracy, 2010). Data were triangulated between individual cases and with observations developed in the literature review and field work, as well as participants' and interviewer's subsequent reflections (Yin, 2017). The emerging patterns from the analysis were structured into more general categories and themes to address the

purpose of the study and research questions to make an original contribution and further extend the theoretical foundation of the study's conceptual framework.

Over a period of 24 days, I correlated five tasks: (a) participant recruitment, (b) scheduling and conducting interviews, (c) recording reflective field notes, (d) reviewing the seminal literature, and (e) transcript review by the participants of the study. The study implemented a data collection process with an audit trail incorporated to establish rigor. Furthermore, the study relied on previous study questions which were proven successful in meeting the established criterion thus establishing content validity.

Data collection consisted of eight in-depth face-to-face interviews using the Skype telecommunication platform. The interviews were conducted over a period of four weeks with an average of two interviews conducted each week beginning July 2, 2018 and concluding July 26, 2018. The interviews were scheduled once consent was obtained by the participant and times were set based on participants' preference. The interviews were conducted in private settings including the participant's workplace or home.

Reflective field notes were recorded and maintained by me starting at the time of the IRB approval by Walden University on June 11, 2018, to record my emotions, thoughts, and reflections throughout the data collection process. I recorded the reactions and experiences to formal aspects of the data collection process to include the responses of the participants' recruitment process, and the receipt of the consent forms. I recorded my reactions to informal aspects of the data collection process such as the empathy and admiration gained for participants as a result of interactions with me throughout this process.

Other than expected delayed responses and scheduling conflicts due to time zones, the interviews were conducted as expected. The delayed responses to the recruitment emails on LinkedIn may have attributed to infrequent log in cycles by potential participants. For every interview, participants described their daily experiences as an older worker in technology infused workplaces. During the interview, a definition of an older worker was provided for each participant, so that all participants had an interpretation of the concept of an older worker. The questions addressed the daily experiences of the older worker in a technology infused workplace related to productivity, as well the daily experience related to ageism and how these experiences help shape the organization.

Initial Contact

I initiated contact on June 21, 2018, recruiting participants by utilizing a criterion search via the LinkedIn Business and employment networking website. The parameters were (a) 55 and older, (b) employed, and (c) technology infused workplace environment. As a result of the search, several profiles yielded older workers ages 55 or older, employed in a technology infused workplace. In alternative cases, participants were informed of the criteria that they must be at least 55 years of age and employed in a technology infused workplace. The final participant formally consented to the interview on July 26, 2018 and the search for new participants concluded at that time. Inbox messages were sent to many individuals who described themselves in their LinkedIn profile as working in a technology infused workplace.

Quite a few responded and immediately followed up, providing their email address for me to contact them and send a consent form for participation in the study. Others responded to the initial contact yet were slower in action when providing the necessary information for me to email a consent form. Still others responded to the initial contact and expressed interest in the study but failed to meet the study criterion or provide any additional information for continued participation. Those who did not meet the criteria provided positive feedback and stated that the study would be helpful and interesting and would prove instrumental to organizations. Some of the individuals who agreed to participate in the study were asked to contact others who fit the criteria regarding the study.

Interviews

Three of the participants responded immediately after initial contact and I received the formal consent within the same day. Some of the participants responded to the initial contact and within a 48-hour period provided formal consent. Several of the participants were scheduled to interview 5 or more days out in order accommodate their busy schedules of the workplace. Two of the participants were rescheduled due to one personal conflict or another for the participant.

Once the interview was scheduled, most of the participants were easily found on the Skype Network. I was able to locate those who could not remember their username using their full name and phone number. I provided my username to each participant, so that the participant would know from whom to expect a connection request. Every participant agreed to be recorded via Skype, and a Skype recorder, a free program that

captures video recordings via Skype along with a Sony ICD-UX560 handheld, digital audio recorder was used to provide video and audio recording as a back-up mechanism.

There were no interruptions and the interviews were conducted successfully as outlined in Appendix A. The participants worked in technology-infused organizations that were in multiple time zones spanning the Continental United States representing several states along the south and west coasts. Skype made interviewing participants convenient in these locations, which aided in replication (Yin, 2017).

All interviewees were encouraged to respond openly to the questions. The semistructured interview design was more conversational, allowing me to seize the quality of the daily experience of the participant as well as observe nonverbal cues in a less formal interview setting. In addition, with reflective field notes, this format improved construct validity via triangulation (Guion et al., 2011).

Reflective Field Notes and Journaling

I began recording reflective field notes upon IRB approval on July 2, 2018. I recorded my anticipation and eagerness at the beginning of the data collection process as well as the achievements and disappointments of the recruitment search and the difficult task of obtaining formal consent and scheduling interviews. I also recorded the process of selecting the tools to be used to ensure accurate data collection as well as record my own impressions and views to minimize any personal bias and expectation. As the interviewer, my passion with each interviewee was to give attention to their daily experiences as they shared them and desired that they be conveyed. I analyzed the tone and attitude of the participants as well as the nonverbal communication. The field notes and review of

transcript afforded an opportunity for participants to reflect on their responses and sentiments, in the most confidential setting (Bolger, Davis, & Rafaeli, 2003).

Very few effective observations were written during the interview but mainly I reflected afterward and followed up with watching the video recording if needed for inference (Patton, 2014). This aided in addition to establishing patterns and themes as the interview process progressed. The mindset of the participant may be expressed nonverbally by breathing heavily, rolling of the eyes, hand wringing, and looking off in reflection. The hand-written notes provide important information as each interviewee expressed their daily experiences and the deep reflection and recollection they experience.

I observed how participants presented more directly and firmly, others seemed very opinionated, but all the participants conveyed an awareness of the obstacles they experience daily in the workplace as older worker. Although the study was concerned with the daily experiences of older workers in a technology infused workplace, I noticed and reflected that there were instances where older workers discussed younger workers daily behaviors. .? In trusting, several participants stated they were successful with technology usage in the workplace due to mandated trainings and continual technological sessions being offered, which is supported to some degree by seminal research. An interesting point in my notes was how the older workers seem to recognize an ageism attitude among their coworkers and their peers.

The topic of early retirement was also pronounced; almost every participant was able to recall experiences where the topic of early retirement was introduced as a means

of an alternative to remaining employed in a technology infused workplace. In particular, those participants who perceived themselves to be victims of ageism, took extra measures to become well versed in the technological sector. Interestingly, the older workers stated that they were not compelled to retire early yet decided to attend the trainings that were offered through the organizations as training protocols.

Transcript Review

Upon the completion of the transcription of the interview, the participant was sent the transcript via email for verification and review. The exchanges back and forth between the participant and the researcher assured accuracy and cleared any thoughts the participant felt may not have been adequately expressed. This process reduces concern over the accuracy of data and improves credibility (Merriam & Tisdell, 2015). Overall, there were very minimal changes made in the interview transcription with a few word omissions that were unclear.

Response to the request that participants review the interview transcript and confirm its accuracy or make changes as needed was slower than anticipated. Most participants responded within 72 hours, but several of the participants took a bit longer. I believe this is due to the busy schedule of the participants and their assurance in the ability of the recording to transpose their words accurately clearly, so transcription is more of a formality than anything else. After providing a gentle reminder, participants affirmed the accuracy of the transcriptions and the data were used for coding. Edits to the transcriptions were minor and had no bearing on the topic of interest for this study. Hand coding took place once the transcripts were updated and edited and the approved files of

the participants were stored in accordance with the data collection design set forth in Chapter 3.

Data Analysis

I adopted the descriptive coding strategy (Saldana, 2016) for the analysis of raw data collected in this study. I used the descriptive coding strategy to assign meanings to segments of raw data (Saldana, 2016), thus using emerging words and phrases I used for categorization and thematic analysis. The raw data (transcripts) collected from the interviews contained the in-depth experiences of study's eight participants. The data I collected from the interview questions provide detailed information for an in-depth contextual understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces.

In qualitative, exploratory studies, coding drives the process of the data collection causing the researcher to reshape the instruments and the perspectives for ongoing studies. The reshaping of the analysis is what took place during this multiple case study leading to themes that emerged of older workers who work in technology infused workplaces. Considering that multiple case studies are based in common settings with the purpose of understanding the process of an under-examined area, a comprehensive understanding of the phenomenon can, in such a way, be explored as soon as data collection comes into existence and continues through the data analysis process (Eisenhardt, 1989; Stake, 2013). This type of method grants the researcher to explore differences and compare and contrast results within and between cases (Yin, 2017). The multiple case study design is significant for replication and supports the exploration of

complex social phenomena as I compared results between and among the eight cases analyzed for this study. An inductive research approach was used as part of the multiple case study strategy to allow themes to emerge from the data, and hence allow older workers' perspectives in technology infused workplaces to drive data analysis and recommendations for further research (Yin, 2017).

Thematic analysis is driven by the standardized process of coding raw data, typically from interviews, examining of meaning and provision of a description of the social reality of participants through the creation of a theme (Vaismoradi, Jones, Turunen, & Snelgrove, 2016). Thematic analysis is classified under the qualitative descriptive design and is dependent upon sets of techniques that are used to analyze textual data to formulate and develop themes that the data analysis process can eventually be used to reflect upon their full meaning in answering the central research question of a qualitative study. The data base for this study was developed accurately by recording and categorizing thoughts that were similar using key words, views, and deeply rooted sentiments (Yin, 2017).

The thematic analysis for this study was done by hand coding the data through a systemic process mapped out in the descriptive coding method (Saldana, 2016). The descriptive coding method was used to assign meanings to segments of data providing an inventory of words or phrases for indexing and categorization of data (Saldana, 2016), from the interviews and the description of the daily experiences of the participants which revealed a theme (Vaismoradi et al., 2016). Once transcript review checking was finalized, I hand-coded the interview notes by utilizing an Excel spreadsheet to enter the

participants' transcribed responses to the questions. The triangulation of data along with word coding also allowed a larger recognition of patterns and increased dependability by drawing attention to common relationships across multiple cases (Yin, 2017).

Once the data was entered, I highlighted key phrases that were appropriate to answering the interview questions. The thematic analysis in my study was conducted using pattern recognition based on interview discussions. The themes and patterns were set apart during the content analysis; nonrecurring evidence was associated to individual case compositions. I used the 'ground up' data analysis strategy (Yin, 2017) to identify codes from raw data. Phrases or sentences that were found to be relevant to answering the central research question were extracted from the transcribed interview data for each participant. The extracted segments of data were evaluated and codes assigned to them. The codes recorded according to each interview question. Further coding analysis of the interviews accrued in categorizing various themes by distinguishing common relationships across multiple cases (Yin, 2017). The following is a description of the finalized categories and themes of this multiple case study, to illustrate how the coding took place for each of those categories and themes.

A total of eight categories that enclose a total of 18 themes were identified for this study. The categories are (a) selection of resources, (b) optimization of resources, (c) compensation of resources, (d) performance limitations, (e) assessing training needs, (f) establishing/ sustaining performance, (g) age-inclusive training needs, (h) older workers as organizational assets.

The eight coding categories are grounded in the conceptual framework. This includes the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990) and the age-inclusive training design framework (Williams van Rooij, 2012)**.** The selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990) builds upon the assumption that people encounter certain limitations as well as opportunities in resources, which leads to decisions concerning the allocation of those resources. *Selection* involves setting goals and choosing goal priorities. Elective and loss-based selection are the two kinds of selection that have been identified. *Elective-based selection* pertains to individual decisions based on available resources. *Loss-based selection* involves the development of new goals that can be achieved with available resources. Thus, goal selection may rely on personal value preferences (e.g., preference for work/life balance following childbirth), or may occur from the loss of resources (e.g., an individual may shift from competing to coaching after an injury). *Optimization* pertains to changes in resource allocation or refinement as a way of achieving higher levels of functioning in selected goals. Optimization involves the investment of energy and time in the acquisition, refinement, and application of goal-relevant resources (i.e., skills) (Young et al., 2007). *Compensation* involves the use and acquisition of alternate means to reach goals and to uphold functioning in the face of anticipated or actual resource loss (Ng & Law, 2014). The age-inclusive training design framework (Williams van Rooij, 2012) guides by a process and principles centered on establishing and sustaining performance that is both effective and efficient. Analyzing the target audience as well as the context and content of the training is crucial for assessing training needs.

By using the manual descriptive coding in this study, I was fully immersed in the data (Cronin, 2014) such that there was an effective and a contextual understanding of data (Finfgeld-Connett, 2014). As a novice researcher, the descriptive manual coding method (Saldana, 2016) was more effective for me than the Computer Assisted Qualitative Data Analysis (CAQDAS) programs for the analysis of data from this study. The data analysis took into consideration all data obtained from the study's archival data in the form of government labor reports and my reflective field notes kept throughout the data collection process and were used to reflect on participants responses during the within-case and cross-case data analysis.

Eight coding categories based on the conceptual framework and 18 themes gleaned from the thematic analysis.

Coding: Selection of resources

Themes: 1) Lifestyle changes to maintain health and wellness since ICT means a longer, sedentary workday; 2) Seeking training independently of one's workplace in ICT upgrades

Coding: Optimization of resources

Themes: 1) Older workers are strong in employer loyalty and job retention; 2) ICTs keep the older worker feeling energized; 3) Camaraderie with younger workers keeps older workers more energized

Coding: Compensation of resources

Themes: 1) Altering ways of thinking about change; 2) Adjusting the work design to maintain good work productivity;

Coding: Performance limitations

Themes: 1) Lower ability to multitask; 2) Adjustment difficulties to rapid updates of technology; 3) Still using some outdated, time-consuming work methods rather than ICT solutions

Coding: Assessing training needs

Themes: 1) No employer assessment of training needs for the older worker's job context

Coding: Establishing/sustaining performance

Themes: 1) Continuous self-education in technology updates

Coding: Age-inclusive training needs

Themes: 1) No employer-sponsored financial incentives for age-inclusive content training in ICTs;

Coding: Older workers as organizational assets

Themes: 1) Feedback due to age capabilities is avoided due to age discrimination laws; 2) Within ICT-infused workplaces, worker recognition is driven mostly by data analytics and not quality of work; 3) Older workers are recognized as valuable only when they can adapt to the speed of ICTs; 4) Older workers are recognized as mentors for soft skills training of younger employees; 5) No financial incentives for older workers to remain in the workforce.

Table 2

Coding and Theme Examples

Participant	Interview Excerpt	Category	Theme
Participant 1	"So it seems like I work less hours, I mean I used to be a very horrible workaholic and treated my body very badly, and worked way too much and then, probably about 10 years ago, I just knew you know that as we get older we have to take better care and so now I try to take advantage of what I can to do more in eight hours a day and have the rest of my time for ore restorative and creative opportunities."	Selection of resources	1) Lifestyle changes to maintain health and wellness since ICT means a longer sedentary workday; 2) Seeking training independently of one's workplace in ICT upgrades;
Participant 2	"I am sweating because my boss is 10 years younger than I am and he is highly motivational he's extremely high energy. He understands that a lot of times with older employees you can trust them with more information and trust them with more work to do because you have a confidence level in knowing that they have done that, been there done that before and they can do it again with very little supervision and motivation. In a lot of ways, I think that is a positive for older workers."	Optimization of resources.	1) Older workers are strong in employer loyalty and job retention; 2) ICTs keep the older worker feeling energized; 3) Camaraderie with younger workers keeps older workers more energized.
Participant 3	"That would depend on as I become older it would depend on my mental state status if my mental status healthy, I will be able to continue otherwise I may be challenged."	Compensation of resources	1) Altering ways of thinking about change; 2) Adjusting the work design to maintain good work productivity;
Participant 4	"I've noticed wherein the past where I could multitask and have several different projects going on simultaneously, you know back to back and forth, the older I get I just feel that I am more productive and I provide a quality deliverable if I focus on one item at a time.	Performance limitations	1) Lower ability to multitask; 2) Adjustment difficulties to rapid updates of technology; 3) Still using some outdated, time-consuming work methods rather than ICT solutions;
Participant 5	"Now here, we haven't had any not so much offered, they do send out different, now I can't say offered directly to me, they offer it to all of the employees. So if you want to take a class for Microsoft or something like that you can."	Assessing training needs	1) No employer assessment of training needs for the older worker's job context.

Participant	Interview Excerpt	Category	Theme
Participant 6	"I just feel like I'm at an advantage as an older person you know cause I notice that a lot of people around my age some people are afraid of technology and I've experienced that you know with some of the teachers that I have had the opportunity to work with their not willing to really push themselves to learn more and it places them at a disadvantage so to me making myself attend the trainings and keep up with the trends and things like that I feel like I am at an advantage for my age group."	Establishing/sustaining performance.	1) Continuous self-education in technology updates;
Participant 7	"I mean as far as just staying up to date on you know my computer information. We have not been really offered any training."	Age-inclusive training needs	1) No employer-sponsored financial incentives for age-inclusive content training in ICTs;
Participant 8	"Employers must be careful not to discriminate against older employees when they make their decisions around hiring, promoting, or terminating employees, based on if the older employee technology savvy."	Older workers as organizational assets.	1) Feedback due to age capabilities is avoided due to age discrimination laws; 2) Within ICT-infused workplaces, worker recognition is driven mostly by data analytics and not quality of work; 3) Older workers are recognized as valuable only when they can adapt to the speed of ICTs; 4) Older workers are recognized as mentors for soft skills training of younger employees; 5) No financial incentives for older workers to remain in the work force

The following is a brief description of each of the 18 themes.

Lifestyle changes to maintain health and wellness since ICT means a longer sedentary workday. This theme describes the selection of resources available in technology- infused workplaces.

Seeking training in ICT upgrades independently of one's workplace. This theme describes the training that is sought by older workers regarding ICT upgrades.

Older workers are strong in employer loyalty and job retention. This theme describes the methods or conditions by which older workers display loyalty in the workplace, resulting in job retention.

ICTs keep the older worker feeling energized. This theme describes participants' daily experiences regarding how they feel energized when using ICTs in the workplace.

Camaraderie with younger workers keeps older workers more energized. This theme describes how older workers feel more energized when camaraderie is established with younger workers in the workplace.

Altering ways of thinking about change. This theme describes how many of the participants believe they must alter their thinking in order to learn about and remain abreast with the usage of ICTs in the workplace.

Adjusting the work design to maintain good work productivity. This theme describes the need for the participants to immediately adjust to the work design while using ICTs in the workplace in order to maintain good work productivity.

Lower ability to multitask. This theme describes the need that participants feel to learn how to multitask effectively while aging in the workplace.

Adjustment difficulties to rapid updates of technology. This theme describes participants' reports that they are aware of the challenges of keeping up with continual updates in technology and how to efficiently adjust to these developments.

Still using some outdated, time-consuming work methods rather than ICT solutions. This theme describes older workers' experiences regarding using older methods in the workplace rather than newer, tech savvy methods.

No employer assessment of training needs for the older worker's job context. This theme describes the lack of training provided by the employer to assist older workers with the context of the job.

Continuous self-education in technology updates. This theme describes the participants' willingness to self-educate in order to remain competitive in the workplace.

No employer-sponsored financial incentives for age-inclusive content training in ICTs. This theme describes the lack of financial incentives sponsored by the employer for age-inclusive content training in order to retain the older worker in the workplace.

Feedback due to age capabilities is avoided due to age discrimination laws. This theme highlights the avoidance that the employer faces in the workplace regarding giving feedback to workers on the basis of age capabilities.

Within ICT-infused workplaces, worker recognition is driven mostly by data analytics and not quality of work. This theme describes how older workers are recognized by data rather than work quality.

Older workers are recognized as valuable only when they can adapt to the speed of ICTs. This theme portrays how older workers are valued only when they can adapt to the use of ICTs in the workplace.

Older workers are recognized as mentors for soft skills training of younger employees. This theme describes how older workers are recognized as mentors in helping younger workers develop soft skills.

No financial incentives for older workers to remain in the work force. This theme describes participants' lack of financial incentives to remain in the workforce past the age of retirement.

Evidence of Trustworthiness

The case study approach reflects the evidence and data of a real social phenomenon. The case study approach requires acuteness and competence from the researcher to make sure that the data analysis results can be viewed, and the requirements are met with methodological rigor (Yin, 2017). The recommended processes by qualitative methodologists and seminal case studies must be followed accurately to ensure the trustworthiness of multiple case study data (Eisenhardt, 1989; Stake, 2013; Yin, 2017). In this section I provide evidence of trustworthiness to add rigidity to the results from data analysis and to solidify that the study is persistent with the protocols of the qualitative methodology. Evidence of trustworthiness authorizes an added value to a qualitative study (Lincoln & Guba, 1985). I discussed evidence of trustworthiness based on the categories of credibility, transferability, dependability, and confirmability.

Credibility

Credibility points out the implementation of multiple pertinent strategies in this study, which validates the trustworthiness of the data (Merriam & Tisdell, 2015). I was able to reach uncompromising research conclusions by way of the systematic processes

which were previously identified by seminal methodology scholars (Denzin & Lincoln, 2011; Patton, 2014; Yin, 2017). Additional credibility was acquired by using the transcript review technique which is developed to address the concerns of individuals who may inquest the credibility of the data (Merriam & Tisdell, 2015). The participants were interviewed in a location of their choosing which enhanced more revealing responses and comfort. The participants were enlightened of the confidentiality agreement and their ability to forego or refuse the interview at any time.

The data analysis was sustained through triangulation, persistent observation, saturation of participatory research, cross case analysis, and word tables (Yin, 2017). In addition, I emphasized the significance of sampling to incorporate participants who are typical members of the broader "older worker generation", increasing the credibility of this study (Baltes & Baltes, 1990; Yin, 2017). The utilization of the cross-case synthesis analysis technique provided similarity, dissimilarity, redundancy, and variation to crisscross to gain a better understanding of the larger group (Stake, 2013). Face to face interviewing via Skype along with video recording increased credibility, enhancing consistent observation of each participant as it relates to nonverbal communication to capture subtle instances that could be overlooked with sole audio recording.

Transferability

Transferability refers to the evidence that is provided to the reader that make maneuverability judgments probable for those who seek to apply the study's findings in other locations, populations, or contexts (Lincoln & Guba, 1985). The study examined the significance of transferability in selecting a research design which weighed whether

the chosen environment was enough to apply to other contexts and participants (Yin, 2017). Interview questions were pilot tested in previous studies (Taneva et al., 2018) and were selected because of the high probability of transferability.

Utilizing an online professional network to choose candidates from across the United States offered an expansive disparity for this study and improves transferability. Transferability relies on the thick, descriptive data provided in the precise accounts of the authentic experience of each participant (Taneva et al., 2018; Yin, 2017). The selective and purposeful selection of the sample of older workers in technology infused workplaces increases transferability by providing an overall understanding of the context of the study. Skype interviewing allowed the researcher to utilize participants in locations near and abroad which aids in replication. Also, Skype enabled the interview interaction to circumvent contextual information which was helpful in refraining from personal reflexivity by the researcher and maintaining an atmosphere that is unbiased (Hanna, 2012).

Dependability

Dependability refers to my action as researcher, and the constancy of how well the approach designed to accomplish credibility and transferability meet the research standards when audited independently. The participant selection process was carefully evaluated for dependability. The recruitment selection was based on a purposeful sample retrieved by a criterion-based search of the online business network, LinkedIn. Participants were e-mailed the criteria for participation in the study, resulting in a confirmation response on whether they met the criteria for consideration. Those

individuals who expressed interest in participating in the study were sent a consent form which reiterated the criterion for participation. Interview questions also required the participant state they met the criteria in the form of a verbal response as well as what I was visually able to verify face to face via Skype. To enhance dependability of the results gleaned from the interview protocol, Taneva et al., (2018) pilot tested the questions in two separate empirical studies.

The outside auditor of the research audit trail is the methodology expert of my Dissertation Committee. The methodology expert inspected the following five stages of the audit process: (a) pre-entry, (b) determination of auditability, (c) formal agreement, (d) determination of trustworthiness (dependability and confirmability), and (e) closure (Lincoln & Guba, 1985). Materials include archived audio and video tape, field notes, written member verified transcripts, and reports which demonstrate findings that echo with seminal literature.

Confirmability

Confirmability refers to the application of measures that establish the rationale that findings are deprived of predisposition and are evidence based (Shenton, 2004). The methodology expert of my dissertation committee serves as external auditor of this study. The methodology expert audited the study for data collection alignment, analysis, findings, interpretations, and recommendations (Lincoln & Guba, 1985). Confirmability is fortified by the use of instruments that are constructed not to depend on research manipulation, although my beliefs and characteristics as an analyst are an instinctive part of the study (Yin, 2017). Data collection tools such as triangulation (Shenton, 2004; Yin,

2017), a deliberately selected derived sample (Merriam, 2014; Morse, 2015), and audit trails which apprehend the researcher's background, context, and previous understanding (Denzin & Lincoln, 2011) which were useful in the development of the "commonality of assertion" (Stake, 2013; Yarzan, 2015). In addition, field notes have been sustained throughout the study to secure my beliefs and interpretations observed. The field notes also minimized researcher bias by elevating self-awareness before, during, and after the process of data collection and during data analysis (Affleck, Zautra, Tennen, & Armeli, 1999).

Study Results

In this theory-generating multiple case research the specific research question was developed to provide answers within the context of the empirical setting (Ketokivi & Choi, 2014). By recording the experiences of older workers in a technology infused workplace, insight was provided based on whether their experiences and their relationships with other workers differed significantly from the experiences of other workers in environments that are considered tech savvy. In addition, I explored the interaction of individuals of multiple generations in one workplace and how ageism may affect the productivity of the older worker in a work environment that is technology infused. The research question guiding this study was as follows: What are the daily experiences of older workers with ICT adoption in technology-infused workplaces? This multiple-case study unveiled such behaviors, activities, and characteristics which emerged from the data analysis attributed to the related themes and patterns that emerged from the raw data that were gathered from the interviews. The identifiable traits of

themes and patterns took place in two phases: (a) thematic analysis of the textual data and (b) cross-case synthesis analysis.

An analysis which examines the similarities, differences, and themes across cases is referred to as a cross-case synthesis analysis. The cross-case analysis is utilized when the unit of analysis is a case, which is a bounded unit just as an individual, artifact, place, or event or a group (Cousins & Bourgeois, 2014). A constant comparative approach was used as the analysis of data throughout so that the new group of data was compared to the existing data throughout the entire study to contrast and compare the thematic patterns across cases (Yin, 2017). The goal in this phase of the analysis was to create rich, thick commentaries from every participant, which would reveal their personal experiences and perceptions of the phenomenon under exploration (Patton & McMahon, 2014). I was only concerned with their responses if the responses were inconsistent.

The data analysis takes into regard the overall data that includes interviews, filed notes, member verified transcriptions, reflections of the internal auditor, and the findings of seminal research articles (Patton & McMahon, 2014). The analysis continued with procedure of cross-case synthesis for familiarity, unfamiliarity, and redundancy as well as crystallization of the data compiled (Stake, 2013). The themes that emerged were classified, and the findings thereof were cross referenced for graphic representation. This established the groundwork for cross-case analysis, one of the transcendent components of the multiple case study design where each case is managed separately yet analyzed collectively with other cases in the study, elevating the researcher's power to act while generalizing the findings (Eisenhardt, 1989; Yin, 2017).

For a multiple-case study, it is important to use a consistent procedure for the collection and analysis of data across all cases (Yin, 2017) to provide a common platform for cross-case comparisons and thematic analysis. In this study, I followed the same procedure for the collection of data for all the eight participants. I adopted a consistent process for manual coding, categorization, and identification of emergent themes across the six cases. The analysis of data was done in two stages: within-case content analysis (Yin, 2017) of data collected from each participant, followed by a cross-case synthesis of data and comparison of emergent themes (Yin, 2017) across the seven cases.

First Phase: Thematic Analysis of the Textual Data

There are step by step processes in the literature that suggest how to conduct a relevant and rigorous thematic analysis (Nowell, Norris, White, & Moules, 2017). The thematic analysis written portion should provide "a concise, coherent, logical, nonrepetitive, and interesting account of the data within and across themes" (Nowell et al., 2017, p. 1). A thematic analysis must also include a clear presentation of the logical processes that depicts how the findings were developed overall so that the implications that are made in relation to the data set are considered dependable and credible. The following thematic analysis follows King (2004) in implying that an essential component of the final report should include the direct quote from participants. Shorter quotes assist with the understanding of specific points of interpretations and demonstrate the pervasiveness of the themes, while lengthy quotes provide the reader an unclouded view of the authentic texts. This presentation of raw data needs to be ingrained within the thematic analysis narrative to show the 'complicated story of the data', that transcends

from a basic narrative of the data and to a credible analysis which can be supported by the assorted means of establishing trustworthiness (Braun & Clarke, 2006).

Supported by the pivotal insights from the in-depth interview the following themes are analyzed and presented here in relation to the central research question.

Lifestyle changes to maintain health and wellness since ICT means a longer, sedentary workday. This theme describes the lifestyle changes that each participant chose to make to maintain their health throughout a workday. As displayed in Table 1, all the participants are at least 55 years old or older. Each participant was asked: How, if at all, have you changed the way you do your job as you have got older?

The view expressed by Participant 4 showcases the attitudes of two of eight of the participants; she stated: "I find myself because my role can be very sedentary constantly in the office and at my desk, I have to be very intentional so I just made some lifestyle changes, so I try to drink a gallon of water a day that forces me to get up from my desk because I am in and out of the restroom and then as opposed to lunch going out to lunch, what I will do is in part of the building that I am in there's an area that is not complete, so I kind of walk that floor for about 30 minutes a day so I am noticing that my energy level can increase once I you know make myself get up and either get some fresh air or just walk around, so that's helped tremendously."

Participant 5 reiterates this sentiment when stating "For me, now I am a people person so if I walk among people usually that gives me energy. I like being busy so usually that's my energy thing because, it amps me up."

Seeking training independently of one's workplace in ICT upgrades. This theme describes the training sought by the older worker on their own without the assistance of the workplace as it relates to ICT usage. The most common description by the participants was the opportunity to access training and to be given an opportunity to complete the trainings offered. Participants responded with a cynical tone when asked "what kind of training to learn new IT skills has been offered to you by your employer?"

Participant 1 offers valuable insight from both the managerial and subordinate perspective, which was commonly reiterated by most of the participants: "It's horrible, nothing So I've just totally self-taught anything new that I want to learn, even our training for new technology is horrid. So, I just have to learn you know sort of self-teach and figure it out ourselves."

Participant 2 stated: "Yeah, they provide training for that and it depends on the employees whether they want to sign up for that training, but part of my job is to make sure that they sign up for that training."

Three of the eight participants respond to the same question similarly to Participant 6; she describes the challenges of offered trainings that are available to older workers in a technology infused workplace saying, "Not in the last year, I am sure if I asked for it you know it would be offered, but we did have the Iready (software program) and things like that but to learn more technology skills we haven't been offered that one yet. I would be happy to learn more technology skills and things like that you know to help me be more current with you know what's coming up you know in the system and everything."

Older workers are strong in employer loyalty and job retention This theme describes conditions or methods by which the employer's loyalty and job retention are strong in the workplace among older workers. Participants responded sporadically when asked the question: What kind of feedback do you receive from your supervisor/manager on your role as an older worker in your company? Participants actively engaged to increase loyalty in the work place. Yet, only two of 10 participants describe similar views that loyalty and job retention are strong as it relates to an employer and older workers. Participant # 4 responded by saying: "None. Again it's not, I've never for fifteen years that I have been there ever recall them targeting that group." Participant #1 relays a similar experience by stating: "yeah, I don't…. it would be illegal if they addressed a deficiency based on my age."

ICTs keep the older worker feeling energized. This theme represents participants' experience of how ICTs in the workplace keeps the older worker feeling energized. Participant #2 discloses: "I would say the ability to get the information that I need quickly, that keeps me energized. The ability to get the information out to my team quickly it's easier to stay energized, having that ability the ability to communicate with them telephonically or per applications through iPhone it kind of motivates you because there are only so many hours in a day. My philosophy is like this, if you could objectively do your job in eight hours then do it in eight hours, but if it takes you fourteen hours, then you are doing something wrong, right? So, it helps to condense the work day on one side, but it has obviously forced a lot of us to expand our work day because the communication is East coast West coast now no time difference and I think most people work longer

hours because of the constant flow of information that we get on iPhones or computers. When you pick up the phone, its 7 or 8 o clock at night, right?"

Participant #1 is the only other participant that is in alignment with Participant #2 as she states: "Anything that is new, so anything that is new and interesting. Change is always intriguing to me when things get tedious and sort of grote and I feel like I am doing the same thing every day, I get bored very easily because I'm a curious person and I just always have to have something different going on so I have a sort of day job and then I do a lot of academic writing and creative writing as a secondary effort because if I'm not, if things start to get sort of routine and in the day job you know I always have a new article or a new textbook or something to keep me challenged."

Camaraderie with younger workers keeps older workers more energized. This theme describes how older workers tend to feel more energized when working around younger workers in the workplace. Older workers do not expect favorable treatment in the workplace, yet energy is drawn from the younger worker in the workplace while the relationship is created. Participant #2 asserts: "The ability to get the information out to my team quickly it's easier to stay energized, having that ability the ability to communicate with them telephonically or per applications through iPhone it kind of motivates you because there are only so many hours in a day."

Three of eight participants assert that the interaction of others is a contributor to them being energized in the workplace. Participant #5 stated: "For me, now I am a people person so if I walk among people usually that gives me energy. I like being busy so usually that's my energy thing because it amps me up." In addition to the former

participants, Participant # 8 states: “The great rapport that I have with my coworkers, especially the younger worker.”

Altering ways of thinking about change. This theme describes how several participants believe how altering their ways will change their thinking. When asked the participants’ response to the question, “How, if at all, have you changed the way you do your job as you have got older?” Participant #2 stated: “Well I have forced myself to learn some of the technology, so you know when I started in this business, and it was a long time, probably before you were born, we would do business via fax machine and the technology has changed so much but nearly everything we do is computer drive. We do all of our expense reports take the pictures and upload our expense receipt and we do that all electronically now, everything I do is done on my laptop virtually. When I travel I either travel with my small laptop and/ or a handheld device, my iPhone. A lot of what I do as far as approving and communicating is done via iPhone and virtually my whole business runs off of some electronic platform or another. so it’s either made on the application that our company provides for us, not only provides but insist that we use and others are just trying to keep up with the younger folks who grew up being in a more technology savvy world.”

Participant #4 explains some of the difficulties experienced even when recognizing that their thinking had changed. Participant #4 states: “Well two things I have to say, I’m not the best. I’ve noticed wherein the past where I could multitask and have several different projects going on simultaneously, you know back to back and forth, the older I get I just feel that I am more productive, and I provide a quality

deliverable if I focus on one item at a time. I know that the circumstances don't always allow for that, but I try to become more aware of my schedule knowing that I just don't do well with multi-tasking as much as I used to. So that's one thing and then the whole vision piece is real you know there's not much I can do without my glasses these days and that can make things sometimes complicated because my job requires a lot of time sitting in front of a computer so there is added eye strain with that so I know age has contributed to that a lot, just the whole vision piece and it's just a and I don't want to say a lack of patience but just as responsibilities increase my level of focus has shifted over the years, so I just need to be centered on one project, one or two no more than that at a time throughout the course of the day."

Adjusting the work design to maintain good work productivity This theme describes the need for the participants to adjust their work design in order for them to maintain positive productivity in the workplace. The participants describe the necessity to adjust frequently as technology is everchanging in the workplace. When asked: How, if at all, have you changed the way you do your job as you have got older? Participant #2 responded by saying, "Well I have forced myself to learn some of the technology, so you know when I started in this business, and it was a long time Julie, probably before you were born, we would do business via fax machine and the technology has changed so much but nearly everything we do is computer drive. We do all of our expense reports take the pictures and upload our expense receipt and we do that all electronically now, everything I do is done on my laptop virtually. When I travel I either travel with my small laptop and/ or a handheld device, my iPhone. A lot of what I do as far as approving and

communicating is done via iPhone and virtually my whole business runs off of some electronic platform or another, so it's either made on the application that our company provides for us, not only provides but insist that we use and others are just trying to keep up with the younger folks who grew up being in a more technology savvy world."

Participant #4 stated "Well two things I have to say, I'm not the best. I've noticed wherein the past where I could multitask and have several different projects going on simultaneously, you know back to back and forth, the older I get I just feel that I am more productive, and I provide a quality deliverable if I focus on one item at a time. I know that the circumstances don't always allow for that, but I try to become more aware of my schedule knowing that I just don't do well with multi-tasking as much as I used to. So that's one thing and then the whole vision piece is real you know there's not much I can do without my glasses these days and that can make things sometimes complicated because my job requires a lot of time sitting in front of a computer so there is added eye strain with that so I know age has contributed to that a lot, just the whole vision piece and it's just a and I don't want to say a lack of patience but just as responsibilities increase my level of focus has shifted over the years so I just need to be centered on one project, one or two no more than that at a time throughout the course of the day."

Lower ability to multitask. This theme describes how the older workers ability is lowered when multitasking in the workplace and was an almost unanimous theme among participants. Participant #8 expounds by stating "Because of my experience in the workforce, I am assigned numerous tasks outside the realm of my job title and responsibilities. This, in itself, tends to play a major role in my time management skills. It

may take me a little longer to complete some tasks. Because I may want to continue old school work habits instead of utilizing modern technology."

Adjustment difficulties to rapid updates of technology. This theme describes the need for the older worker to adjust to the difficulty of the rapid technology updates in the workplace. Participant# 6 clarifies a belief that is shared by two of the eight participants in this study that it is difficult to adjust in the workplace with technology updates. When asked: What are the key challenges for you as a mature worker in the workplace? Participant #6 stated, "As a person getting older, you know one of the key challenges is keeping up with all the new facets that come out with technology, and I never was really a person that was very tech savvy so you know it took a little effort to learn it, but once I learned it I have it, it's just keeping up with all of the changes."

Participant #5 expounds on this thought process: "Now for me I like computers, well I've worked with computers for years and that's not so hard. It has changed over the years, you are talking about 30 years ago versus now, it's changed a lot so probably the only challenge would be having to learn over and re-adapt to different changes in this society."

Still using some outdated, time-consuming work methods rather than ICT solutions. This theme describes the desire for participants to continue utilizing old methods rather than embracing new methods that are more tech savvy. A couple of participants report that it is much easier to revert to the older way of doing things which are noted as outdated, than implement ICT solutions. When participants were asked: How would you describe your experience as an older worker in a workplace dependent on

technology? Participant #5 mentioned: "At one point, I was reluctant to try more innovative ways student learning techniques (discomfort with new technologies), I was more apt to use traditional lecture, note taking, etc. But upon becoming familiar with student technical interests, I soon incorporated this teaching technique in to my lesson plan."

Additionally, Participant #2 states: "So, I think one of the key challenges is trying to drink through the information technology firehouse because there is so much coming at you in so many different directions its sometimes difficult to get, it's difficult to internalize it, it's difficult to walk from one program to another, one website to another, one application to another and that is of course a little difficult. So how does it affect me in my job, so my job is not to necessarily sell stuff as the director of National accounts, my job is to sell other people on selling stuff and managing a team of 15 or 16 people and 10 states so the technology part is absolutely important for the communication side but as far as some of the applications there are some things that I don't need to know and other things that I kind of wish I knew or wish that I was as handy at bouncing around between the different applications as some of my newer employees are."

No employer assessment of training needs for the older worker's job context. This was another common theme stated by the older workers. When asked: In what ways does your employer recognize of the role that mature employees can play in daily work life at your company? Participant #2 eluded to the difficulty of being assessed effectively through the training needs as it relates to the job context by stating: "Well, that's a great question too, and it might be hard to fit in with a window of information and

communication of technology the same reports that I have available to me our senior management team has available to them so they drive measurement metrics, they see everything that I see and more and so when they put out reports that shows rankings, reports by director or by national account manager there's recognition available through that most of the programs that we use are transparent so we have people in our corporate office for example that can tell how many times my account managers recognize other employees for their participation or contribution of what we do every day and as a result the senior management team can get a better look at how we operate and train our sales teams. I think that's really what it is, I think that if you look at it from a sales perspective which is what I am just a salesman at the end of the day that sounds awful and real humble but that really is what it is salesmen… salespeople are motivated by as much by recognition as they are by compensation."

Participant #7 states: "I think they recognize the value of older employees just with the longevity the fact that we are willing to learn and that we have been there long enough that we are familiar with things that go on in our office." Several participants describe a void in this theme as assessments are not frequent in the workplace in order to achieve success.

Continuous self-education in technology update. This theme describes participants' reports that they are very aware of the challenges to continuously self - educate as it relates to technology. Therefore, the participants describe their willingness to attend trainings offered in the workplace so that they will potentially remain abreast and competitive when upward mobility opportunities in the workplace become available.

When asked, “What kind of training to learn new IT skills has been offered to you by your employer?” most of the participants stated that trainings are not commonly offered and as a result they have to seek training on their own.

For example, Participant #5 stated “Most of the trainings deal with the online environment. We also have trainings on updated and trending IT equipment to enhance classroom lectures and student learning.”

Participant #4 shares a similar experience: “No, mainly when it comes to IT, it’s when they are implementing a new system or a new software program, they want employees to take advantage of, so the training comes or is offered at that particular time.”

No employer-sponsored financial incentives for age-inclusive content training in ICTs. This theme describes the lack of incentives that are sponsored financially by employers for training in ICTs that are age inclusive. Two of the participants describe their experiences where there were no financial incentives provided by the employer, when asked “What kind of training to update current job skills has been offered to you by your employer?” Participant #1 states, “It’s horrible, nothing….so I’ve just totally self-taught anything new that I want to learn, even our training for new technology is horrid, So, I just have to learn you know sort of self-teach and figure it out ourselves.” As such Participant #4 shares a similar stance by stating “No, mainly when it comes to IT, it’s when they are implementing a new system or a new software program, they want employees to take advantage of, so the training comes or is offered at that particular time.”

Feedback due to age capabilities is avoided due to age discrimination laws. This theme describes the feedback provided by management that avoids discrimination laws in the workplace. When asked, "What kind of feedback do you receive from your supervisor/manager on your role as an older worker in your company?" three participants shared similar responses by stating that most employers fail to provide specific feedback to avoid age discrimination in the workplace. Participant #2 states:" I am 63 years old, and I have had people ask me when am I going to retire? I am sweating because my boss is 10 years younger than I am and he is highly motivational he's extremely high energy. He understands that a lot of times with older employees you can trust them with more information and trust them with more work to do because you have a confidence level in knowing that they have done that, been there done that before and they can do it again with very little supervision and motivation. In a lot of ways, I think that is a positive for older workers. If I were going to interview for a job, that is exactly what I would say. I hadn't had to interview for a job for quite a long time." Participant #1 simply states, "Yeah, I don't…. it would be illegal if they addressed a deficiency based on my age." Participant #3 aligns with the other two participants by stating, "I don't get any feedback as an older person because my company is very aware of being very politically correct with discrimination, age discrimination so they do not sort of umm how can I say it um they do not treat you as an older person, they treat you equally as the younger person."

Within ICT-infused workplaces, worker recognition is driven mostly by data analytics and not quality of work. This theme describes data analytics are driven by worker recognition in ICT-infused workplaces instead of the quality of work. Three of

the eight participants' experiences resemble when asked "In what ways does your employer recognize of the role that mature employees can play in daily work life at your company?" Participant #2 states, "well, that's a great question too, and it might be hard to fit in with a window of information and communication of technology the same reports that I have available to me our senior management team has available to them so they drive measurement metrics, they see everything that I see and more and so when they put out reports that shows rankings, reports by director or by national account manager there's recognition available through that most of the programs that we use are transparent so we have people in our corporate office for example that can tell how many times my account managers recognize other employees for their participation or contribution of what we do every day and as a result the senior management team can get a better look at how we operate and train our sales teams. I think that's really what it is, I think that if you look at it from a sales perspective which is what I am just a salesman at the end of the day that sounds awful and real humble but that really is what it is salesmen… salespeople are motivated by as much by recognition as they are by compensation."

Participant #1 states, "They don't, very much of an age bias, but you know I am a faculty member and faculty to many institutions are a commodity so we are not always thought of especially older faculty are not always, you know there is some kind of stereotype that were not technology proficient for some reason, I guess because we didn't grow up with computers but it's a bias that I feel like I am always having to address every day." Participant #7 states "I think they recognize the value of older employees just with

the longevity the fact that we are willing to learn and that we have been there long enough that we are familiar with things that go on in our office."

Older workers are recognized as valuable only when they can adapt to the speed of ICTs. This theme illustrates older workers depicted as valuable only when adaptation occurs with the speed of ICTs. When asked, "How, if at all, have you changed the way you do your job as you have got older?" Participant #1 states, "I just have always adapted to various environments. I started a career as a journalist with like a reporter notebook and (laughs), we had a very uh analog system. I guess those days for submitting work and then by the late 90s I was developing distance learning programs some of the first in the country that were accredited by the higher learning commission and so was just you know, always trying to stay a step ahead with what modes of online or digital communication were available and just have advanced those as time went on. In those days we didn't have broadband, most students were on dial up so you know we didn't have the video capabilities that we have now or any kind of screen cast or any other ways that many online faculty communicate today so I've just always you know been looking on sort of what's ahead, I think that maybe what I've done is think differently, about data especially in the last five years with sort of the big data capabilities and analytics and you know just sort of forecasting based on what we know about patterns of behavior with individuals online. It's just been a constant adaptor to what's available and always sort of thinking ahead to what needs to be available so I'm one of those people that just you know if something is new, I jump on it to see what it's like."

Participant #8 states, “I have become more conscientious. I have taken time to learn new ways of completing job responsibility. I have welcome training in the technology world. I have made a point to incorporate technology in to my every day work routine. I have learned the thought process of the younger employee which allows for a better understanding and work relationship.”

Participant #4 shares a similar experience by stating, “I think they recognize the value of older employees just with the longevity the fact that we are willing to learn and that we have been there long enough that we are familiar with things that go on in our office.”

Older workers are recognized as mentors for soft skills training of younger employees. This theme describes the older worker as being recognized for their soft skills as it relates to training the younger employees. When asked, “What are the key challenges for you as a mature worker in the workplace?” Participant #8 states, “In most cases your manager, supervisor and/or the majority of coworker are going to be 15 -20 years younger. The mindset of these coworkers is a little different in the way they view things. As an older worker, I have institutional knowledge and company memory. This allows me to know “how things work” and how to get things done”. On the other hand, the younger employee deals with matters based on what he or she has researched or learned in school/trainings. I am more stable and more likely to stay on with the same employer, but most of the younger workers have moved on to another job. I require less supervision, but the younger employee needs more hands-on nurturing. I am more apt to produce a higher quality of work, because I know the job well and have had the time to

formulate a good work ethic. I notice the younger worker mindset is-you get what you pay for and are more apt to seek other employment at drop of a hat."

Participant #6 states "As a person getting older, you know one of the key challenges is keeping up with all the new facets that come out with technology, and I never was really a person that was very tech savvy so you know it took a little effort to learn it but once I learned it I have it it's just keeping up with all of the changes."

No financial incentives for older workers to remain in the workforce. This theme describes the lack of financial incentives provided for older workers to remain in the workforce. When asked, "What financial incentives does your employer offer older workers to remain in the workforce instead of retiring?" three out of the eight participants state that there aren't any financial incentives provided by their employer. Participant #1 states, "We have a variety of sort of financial stipends if we do extra things. When we deliver a webinar, if we publish an article on a peer review journal, if we present at a conference there's additional sort of faculty honorarium funding, but that's about it." Participant #3 states, "none really, I wouldn't say that they do offer financial incentives for older people, that is one thing that is still, how can I say, that still needs to grow in the states." Participant #4 states, "I'm not aware of any incentives. The institution, I don't if there is any intentional targeting of the group and we have if I had to guess quite a few and they may even dominate the employment roles at the institution, those that are 50 and older. It's just respected that, that group has a lot more maturity and experiences to the role so for that reason because there is such a large number, I don't know if they have ever just gone out and said what are your specific needs, and how can we further support

that. Because they feel like you are still there still functioning or operating and doing well in your role, there's no need to do that."

Second Phase: Cross-Case Synthesis and Analysis

Cross-case analysis and synthesis was used as the data analysis technique to incorporate critical findings of individual cases studies and once themes were arranged across the multiple cases in this study (Yin, 2017). Because of the analogously low number of cases affiliated with a qualitative study, word tables offered an alternative method to seek for patterns across cases instead of the meta-analysis associated with large numbers of case studies (Yin, 2017). Because real life experiences are complex and patterns may not be readily observable, the cross-case synthesis data analysis method strengthened trustworthiness of data and allowed generalization to the analysis process (Eisenhardt, 1989; Yin, 2017). Cross-case synthesis was a useful data analysis tool so I may systemically identify the convergent and divergent data across casers and remove any minor data unrelated to the purpose of the study (Yin, 2017). I enhanced the trustworthiness of data by consolidating, and interpreting the data to establish a coherent argument based on evidence and defined through the lens of the study's conceptual framework (Cooper & White, 2012; Yin, 2017).

The cumulative theme frequencies of occurrence by participant is illustrated in Figure 1, in which I combined the thematic analysis results from each case to graphically provide the reader with an idea of how many themes converged across cases based on the findings of this multiple-case study.

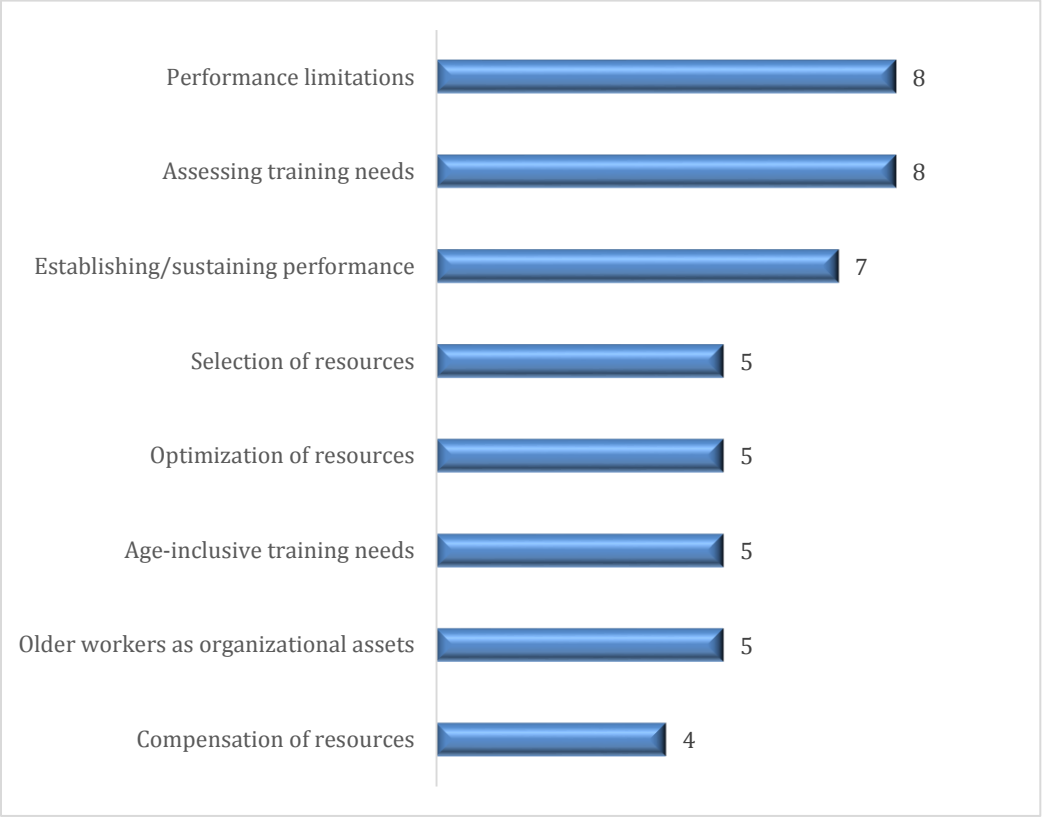

Figure 1. Multiple case analysis (theme frequency of occurrence by participant).

The cross-case analysis was an iterative process and I first analyzed each of the eight cases separately. Recurrent themes were identified across the data to meet the purpose of the study of gaining a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. The cumulative frequencies of occurrence for each theme are illustrated in Figure 1, in which I combined the data analysis from each case while analyzing the convergent and divergent data across the eight cases. In Figure 1, I present a multiple case study cross-case synthesis graph as a visual representation of older workers' daily experiences with ICT adoption in technology-infused workplaces, where the majority of employees are under the age of 55.

Two categories that figured prominently across the data collected from the eight cases was performance limitations and assessing training needs. All participants discussed that their employer did not carry out any assessment of their training needs—either related to being an older worker or within the context of the employees' job. Training was offered sporadically and employees could pursue seminars and webinars on their own. The clear issues everyone expressed was there was an absence of employer or HR-based organized effort to assess the training needs of older employees. Eight out of eight participants discussed recruiting incidents of performance limitations. All participants mentioned that it was difficult to remain abreast with the constant upgrades of technology needed to perform their job tasks. The participants described these incidents as ones that meant they needed to work harder than younger employees to maintain their work performance, particularly in the area of speed to task completion.

Another prominent category closely related to the ones in this paragraph and discussed by seven out of the eight participants was that of establishing/ sustaining performance. Seven older workers mentioned needing to continuously self-educate in technology updates or become anxious of being left behind the curve in knowledge needed to do their jobs at a satisfactory level. Five out eight participants shared experiences related to selection of resources and optimization of resources. Participants discussed that they needed to focus on which resources would lengthen their work life and help them in performing well at their ICT-infused workplace. For these older workers, ICT work meant sitting in a chair most of the day and this raised growing

concerns about health issues. The participants sought out ways and means to incorporate changes in the lifestyle in order to maintain optimum health and wellness.

To optimize their cognitive resources, five out of eight participants were pro-active in pursuing ICT training opportunities outside the workplace that included being part of age-inclusive learning environments. These older workers believed they have to do extra "homework" outside the job compared to their younger counterparts to keep up with technology trends, many of which seemed to be second nature to their Millennial-aged peers. Older workers relied on their strength in employer loyalty and remaining on the job longer than many of their Millennial-aged peers to garner favor and preference with their employer. Participants reported feeling energized and positive about being in an ICT environment and maintained their relationships with younger peers added to their optimism and energy levels at work.

In the next prominent category five out of eight participants shared experiences they believed made them as older workers an asset to their organizations. The five participants also expressed reticence on what supervisors—all younger than themselves—may really believe about older workers and their capabilities due to fear of violating age discrimination laws. The participants believe that they are "hidden" assets for their organizations, almost like unsung heroes, being that organizational leaders evaluate employee performance by data analytics and not quality of work, and older workers are recognized as valuable only when they can adapt to the speed of completing ICT tasks. Although there are no financial incentives for older workers to remain in the

workforce, these five participants did state they are recognized as mentors for soft skills training of younger employees.

The final category was that of compensation of resources. Four out of eight participants describe personal processes they went through in order to alter ways of thinking about change in the workplace. Many older workers complained about changes and participants believed that was due to fear of not keeping up with younger employees. Participants that believe they were successful at adapting to the changing circumstances of a technology-infused workplace, adjusted the way they worked to maintain good work productivity. While these four older workers in technology-infused workplaces were willing to learn new way of working, they also recognized that staying in the workforce means keeping up mentally with younger employees, and that special assets of older workers are rarely recognized by employers.

Triangulation. The codes spanned themes across many methodologies including historical literature, field notes, and interviews, while additionally binding data sources (Saldana, 2015). The triangulation of data sources allowed for a more comprehensive consideration of the data while enhancing the overall quality of the study (Yin, 2017). One valuable element of the data collection were handwritten notes. The participant's mental state is often nonverbally communicated through their body language, such as in subconscious movements or facial expressions, or through auditory cues such as deep exhales, silence, or intonation (Stake, 2013). The handwritten notes supplied a contextual report of the participants' nonverbal behaviors such as intensity, uncertainty, and fears; the notes thus allowed for a more complete recollection and supplied a literal translation

of the auditory data in the recorded interviews (Saldana, 2015). The interview transcriptions aided in reviewing my positionality and reflexivity as the researcher (Berger, 2015). Each participant was given a copy of the digital transcript of their interview and asked to read and confirm their responses and the meanings associated with them (Merriam & Tisdell, 2015).

In order to standardize the process of data collection, an interview protocol was utilized for the semistructured interviews (see Appendix A). Evidence concerning the study plan's development can be found in the research record's audit trail (Stake, 2013). The audit trail is comprised of uploaded articles, memos, and the like that indicate the documentations, changes, and additions that occurred in the course of a study (Yin, 2017). The auditable examination of my study is provided by the coding structure, synthesis of reports for transcript review, and memos regarding progress made on the research. Methodological triangulation and an audit trail were used to enhance the dependability of the results of the study (Guion et al., 2011). I analyzed physical artifacts such as databases and government reports on older workers' daily experiences within the management and ICT labor market in the United States and referred to data from my reflective journal notes during the phase of data analysis in order to ensure the process of methods triangulation.

As a researcher, my maintenance of a neutral state was aided by reflective journaling. The practice of researchers recording and documenting their emotions concerning conditions, behaviors, or events that can cause an emotional reaction was recommended by Yin (2017). The practice of reflexivity involves avoiding researcher

bias by the researcher noting in a journal beliefs and emotions regarding the data (Lincoln & Guba, 1985). As much as possible, I worked on holding back my own cease judgments as participants discussed their experiences.

I located about 200 articles including popular media (magazine, newspaper), white papers, and company media, business, and government reports pertinent to my study. Despite the fact that these reports were used as sources to complement the semistructured interviews, they were not substantial enough for use in the literature review. In addition, I read and subsequently annotated peer-reviewed scholarly papers from about 300 scientific journals. I analyzed 250 physical artifacts, such government, media, and company reports, directly connected to my themes following the semistructured interviews, in order to proceed with the process of method triangulation with the aim of finding an answer to the research question (Yin, 2017). I used this archival data set to develop deep, thick, rich information within the following themes relating to the older worker in technology-infused workplaces within the United States: (a) lifestyle changes to maintain health and wellness since ICT means a longer, sedentary workday, (b) seeking training independently of one's workplace in ICT upgrades, (c) older workers are strong in employer loyalty and job retention, (d) ICTs keep the older worker feeling energized, (e) camaraderie with younger workers keeps older workers more energized, (f) altering ways of thinking about change, (g) adjusting the work design to maintain good work productivity, (h) lower ability to multitask, (i) adjustment difficulties to rapid updates of technology, (j) still using some outdated, time-consuming work methods rather than ICT solutions, (k) no employer assessment of training needs for

the older worker's job context, (l) continuous self-education in technology updates, (m) no employer-sponsored financial incentives for age-inclusive content training in ICTs, (n) feedback due to age capabilities is avoided due to age discrimination laws, within ICT-infused workplaces, (o) worker recognition is driven mostly by data analytics and not quality of work, (p) older workers are recognized as valuable only when they can adapt to the speed of ICTs, (q) older workers are recognized as mentors for soft skills training of younger employees, (r) no financial incentives for older workers to remain in the workforce.

My cumulative experience of reading hundreds of sources aided me in identifying themes that were empirically accurate, complete, value-added, credible, and fair by aiding me in questioning the meaning of repeated ideas and concepts. This process of interpretation can involve a kind of triangulation that can ensure the richness of data, which is the methodological triangulation of sources of evidence to provide answers to the research questions and ascribe meaning to the data (Fusch & Ness, 2015). A sufficient amount of rich information to ensure that the study design can be replicated was supplied by the methodological triangulation of three sources of data (Guion et al., 2011). I illustrated how this study's findings contributed to the body of literature regarding older workers' daily experiences within the management and ICT labor market in the United States and interpreted and analyzed the results of the study within the bounds of the conceptual framework.

Summary

In this chapter I presented a case by case analysis of a total of eight individual cases followed by a cross-case analysis and synthesis process to providing answers for this multiple case study's central research question: *What are the daily experiences of older workers with ICT adoption in technology-infused workplaces?* The first phase of data analysis involved the within-case analysis of data using the descriptive coding method to identify codes and categories from relevant segments that provide answers to the research question. Based on the findings, I identified and presented a total of eight categories grounded in the conceptual framework of the study, and a total of eighteen themes, leading to thick, rich data on the views of older workers in technology-infused workplaces. The eight categories that enclose a total of 18 themes identified for this study were (a) selection of resources, (b) optimization of resources, (c) compensation of resources, (d) performance limitations, (e) assessing training needs, (f) establishing/ sustaining performance, (g) age-inclusive training needs, and (h) older workers as organizational assets.

I used cross-case analysis and synthesis was used as the data analysis technique to incorporate critical findings of individual cases studies and once themes were arranged across the multiple cases in this study. The 18 themes gleaned from raw data within each category are the following: (a) lifestyle changes to maintain health and wellness since ICT means a longer, sedentary workday; (b) seeking training independently of one's workplace in ICT upgrades; (c) older workers are strong in employer loyalty and job retention; (d) ICTs keep the older worker feeling energized; (e) camaraderie with younger

workers keeps older workers more energized; (f) altering ways of thinking about change; (g) adjusting the work design to maintain good work productivity; (h) lower ability to multitask; (i) adjustment difficulties to rapid updates of technology; (j) still using some outdated, time-consuming work methods rather than ICT solutions; (k) no employer assessment of training needs for the older worker's job context; (l) continuous self-education in technology updates; (m) no employer-sponsored financial incentives for age-inclusive content training in ICTs; (n) feedback due to age capabilities is avoided due to age discrimination laws; (o) within ICT-infused workplaces, worker recognition is driven mostly by data analytics and not quality of work; (p) older workers are recognized as valuable only when they can adapt to the speed of ICTs; (q) older workers are recognized as mentors for soft skills training of younger employees; and (r) no financial incentives for older workers to remain in the workforce.

To enhance the trustworthiness of the study's data, I employed methodological triangulation of the following data sources: interviews, journaling/reflective field notes, and literature. This triangulation provides enough in-depth information for the study to be replicated by future researchers. I analyzed and interpreted the multiple case study results through the lens of the conceptual framework and presented how study findings add to the body of knowledge related to older workers and ICT adoption in the workplace.

In Chapter 5, I present further interpretation of the study findings with respect to how they compare or contrast with the literature reviewed in Chapter 2. Additionally, I describe how future research can build on the findings of this study and contribute to a

deeper understanding of older workers' daily experiences in today's technology-infused workplace in the United States.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative exploratory multiple case study was to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces. The nature of the study is qualitative, so the method aligns with the purpose of the study of exploring the daily experiences of a maturing workforce to inform organizations on addressing technology barriers to productivity associated with and supporting this employee demographic group's adoption of ever-evolving ICT devices in today's organizations (Behaghel et al., 2014; Tams, 2017). This study is framed by, first, the SOC framework for successful aging (Baltes & Baltes, 1990) and, second, the age-inclusive training design framework (Williams van Rooij, 2012).

A multiple-case analysis of eight interviews and then thematic analysis and cross-case synthesis and analysis revealed 18 prominent themes reflecting the daily experiences of older workers: (a) lifestyle changes to maintain health and wellness since ICT means a longer, sedentary workday; (b) seeking training independently of one's workplace in ICT upgrades; (c) older workers are strong in employer loyalty and job retention; (d) ICTs keep the older worker feeling energized; (e) camaraderie with younger workers keeps older workers more energized; (f) altering ways of thinking about change; (g) adjusting the work design to maintain good work productivity; (h) lower ability to multitask; (i) adjustment difficulties to rapid updates of technology; (j) still using some outdated, time-consuming work methods rather than ICT solutions; (k) no employer assessment of training needs for the older worker's job context; (l) continuous self-education in

technology updates; (m) no employer-sponsored financial incentives for age-inclusive content training in ICTs; (n) feedback due to age capabilities is avoided due to age discrimination laws; (o) within ICT-infused workplaces, worker recognition is driven mostly by data analytics and not quality of work; (p) older workers are recognized as valuable only when they can adapt to the speed of ICTs; (q) older workers are recognized as mentors for soft skills training of younger employees; and (r) no financial incentives for older workers to remain in the workforce.

Interpretation of Findings

The findings of this multiple case study confirm or extend current knowledge in the discipline, with each case presenting examples of issues discussed in the literature review in Chapter 2. In this section, the study's findings are presented and reviewed in the context of the eight categories that emerged from the data analysis. I compare each of these eight categories with relevant concepts from the conceptual framework and the extant literature reviewed in Chapter 2. I provide evidence from the eight semistructured interviews to support how the study's findings either confirm or disconfirm existing knowledge, or even extend it. Extension studies, such as this multiple case study, provide not only replication evidence but also support extending prior research results with offering new and important theoretical directions (see Bonett, 2012).

Selection of resources. This study's findings confirmed those of research undertaken in the past about older workers and the difficulties associated with managing an aging workforce (Brooke & Taylor, 2005). Peeters and van Emmerik (2008) chronicled how mental, cognitive, and physical changes occur as individuals age. The

results of this study confirm that older workers want to stay with an employer longer if their contributions are valued and they are treated with fairness (Armstrong-Stassen & Schlosser, 2011). This study's results confirm that the technology challenges faced by older workers are handled through selection of resources to continue working and optimize physical health and mental well-being (Kraiger, 2017; Ng & Law, 2014). This finding is supported by the SOC framework for successful aging (Baltes & Baltes, 1990), first developed through Baltes and Baltes' seminal research on the psychology of aging, defining how older workers manage their lives in a manner that promotes their well-being and personal development (Baltes & Baltes, 1990; Baltes & Dickson, 2001; Freund & Baltes, 1998).

Optimization of resources. This research confirms research by Armstrong-Stassen and Schlosser (2011) which suggested that older workers want to stay with an employer longer if what they contribute to the workplace is valued and appreciated. As such, the optimization of resources in the workplace posits a problem for the older worker. Brooke (2003) conducted a cost–benefit analysis which determined that investing in older workers (e.g., trainings, recruitment) was well worth the cost while in comparison to investments made in younger workers. The loss of functioning and resources contributes to the preconceived images of older workers' low productivity and performance, with a difficulty of coping ability (Kanfer & Ackerman, 2004; Maurer et al., 2008). To optimize an older worker's performance in certain domains, an older worker may allocate their efforts and resource use in the workplace to achieve the results desired and compensate for loss (Baltes et al., 2014; Moghimi et al., 2017).

Compensation of resources. The obtainment and the use of different ways to reach goals and maintain functions during the anticipated or actual loss of resources is perceived as compensation (Ng & Law, 2014). Compensation is inclusive when the effort of gaining new resources becomes difficult. Hence, the older workers in the study worked on restructuring their resources and efforts in the workplace to both their performances in order to achieve the results desired or to compensate for the loss and the desired level of performance (Baltes et al., 2014; Moghimi et al., 2017). The findings of my study are consistent with previous research conducted by Baltes et al. (2012) as it relates to the selection optimization compensations framework. The fundamental goal of the framework is that the individual alters their resources to deal with changes that are age related while effectively functioning (citation). Therefore, the adjustment in the workplace with their abilities and personal preferences, assisting in the creation of developmental opportunities benefits the employee with their work engagement while replacing ineffective means and the activation of unused resources daily (Zacher et al., 2015).

Performance limitations. My study confirmed findings by Bugard and Seelve (2017) when stating that the negative perceptions could attribute to job displacements among older workers by the employers creating uncertainty in unemployment or retirement opportunities. Because of this, those who have decided to work past their retirement age, will need to be trained for their roles in the workplace (Kraiger, 2017). Challenges are created within organizations when there is little consideration on how to

help older workers adapt to technology and develop technology that is adopted by and actively addresses the needs of the older worker (Truxillo et al., 2015).

Assessing training needs. Older workers may find it difficult to remain prevalent in the technology wave as the technology advancements create manual labor reduction for those who were well versed as laborers. Healthcare, retail, and technology-based jobs are jobs of the future which will lead to a decrease in manufacturing and agricultural jobs as predicted for the United States (BLS, 2016b). Challenges are prevalent in organizations of competitiveness economically, globally, and technically, making it difficult to decide if mobile computing and social media are immediate communications for employees, managers, customers, and suppliers. As a result, it is imperative to provide training for the older worker (Noe et al., 2014). With the increase of technology usage, impactful changes have taken place in how lives are lived (Colbert et al., 2016). Because of the immediate access to the internet, the world is attached continually to the connection to multiple types of information and communication websites (Ferrara, 2016). The digital skills of the workforce will continue to develop and change due to the way technology is being accessed in the workplace (Colbert et al., 2016). Considering the digital workforce will share work space with multiple generations who are older and less comfortable with technology usage, organizations will need to monitor the conflicts that will take place once the groups come together (Colbert et al., 2016).

Establishing/ sustaining performance. Older workers are often more engaged with learning and opportunities for development when they receive support from their organizations and they feel that they are being treated with respect and dignity. There is a

positive interconnection between interpersonal relationships with coworkers and older workers who decide to continue working (Cheung et al., 2013). As a part of the organization, professional employees and the older managerial staff realized that if their job assignments were interesting and important to them, then the intentions of the individual displayed loyalty (Armstrong-Stassen & Ursel, 2009; Earl et al., 2017). Organizational bonds are a huge factor for older workers who decide to continue working past the retirement age (Büsch et al., 2012). if working longer is determined beneficial for the economy, society, and the worker, then the policies regarding legislation could be adopted as an incentive increase for individuals to remain in the labor force and for organizations to employ older workers (Clark & Morrill, 2017).

Age-inclusive training needs. Jobs availability for the older adult is likely different from the job that they trained or attended school for or have work experience in (Parry & McCarthy, 2017). Previous research on the older worker uncovered information regarding ageism and how the older worker is viewed in the workplace, and how using updated HR policies to educate and inform will dismantle misconceptions including the integration of emerging technology. Those older workers who decide to cultivate opportunities are more devoted to and determined to remain with their organizations (Kim & Kang, 2017). Relationships with the employer and their employees have tremendously been affected by the environmental changes in the workplace and older workers are well aware of the threat of losing stability in employment (Cheung et al., 2016).

Older workers as organizational assets. Workplace contribution by the older worker is displayed through work experience, commitment, reliability, and positive attitudes, yet there is a limited amount of literature that touches on how the graying workforce can age successfully at work (Zacher & Rudolph, 2017). Truxillo et al. (2012) proposed six task, knowledge, and social work characteristics (i.e., task significance, specializations, social support, job autonomy, skill variety, and interdependence) that relate positively to indicators of characteristics that are need in older workers. Consequently, social support, flexible work arrangements, and relationships with coworkers are also a pivotal adjustment for growth in the workplace (Earl et al., 2017).

Limitations of the Study

Even though Merriam and Tisdell (2015) stated that having six to 10 participants provides a large enough sampling for practical interpretation in qualitative studies, there are hindrances to gathering a larger number of participants. There are fewer older workers over the age of 55 who are still employed and even fewer who are employed in a technology infused workplace that is considered as a predominantly younger work environment. Because there is limited access to social media outlets that provide such information, personal knowledge is needed to gather potential participants. Because of the plethora of diverse characteristics, it is difficult to create a participant pool that is large enough for a quantitative analysis; this is a primary reason is why I chose a qualitative study to meet the purpose of my study.

The selection of eight participants was designed to allow more units for analysis for a multiple case study while increasing the possibility of revealing uncommon

observations or variances. Confidentiality of participant identities was most important in the study so that the older worker did not face any retaliation in the form of ageism in the workplace from their younger coworkers (Merriam & Tisdell, 2015). Plus, the concern of memory lapse as time accrued between the adaptation of technology and the interview was prevalent. To satisfy this concern, I conducted conversational interview discussions were conducted so that the older worker could share candid events and perhaps stimulate recall.

Issues pertaining to the dependability of the study results may be raised in small sample studies such as this one. Dependability may be limited due to the geographic location differences of the participants. Observations may differ in companies that vary in the scope of age diversity, technology adaptation, or access to resources. While using an online professional network to select candidates, a maximum variance of sampling improved the transferability of the study. This criterion-based sampling fused a heterogeneous group of older participants to support maximum variation sampling (see Benoot, Hannes, & Bilsen, 2016).

A limitation of the study can be viewed as the stance of the researcher and researcher bias when analyzing both the interview data and journal notes. Common data collection techniques in case study research are interviewing and journaling (Merriam & Tisdell, 2015; Stake, 2013). Reflexivity is another trademark of qualitative data analysis and can affect the trustworthiness of the data (citation). The approach of reflexivity is not a new phenomenon, and it has been part of qualitative research methods in organizational research for several decades (Haynes, 2012). My commitment as a researcher was to

work with integrity to make this credible research. To reduce reflexivity bias, I was especially sensitive to any contradictory findings vis a vis the extant literature to eliminate any preconceived perceptions that could influence my judgment from such previous studies (see Yin, 2017). Trustworthiness of the data was guarded from reflexivity-generated bias by depending on other sources of evidence to justify any insight of participants and searching for adverse evidence as speedily as possible (Alvesson & Sköldberg, 2017).

Recommendations

I designed this qualitative study based on recommendations from scholars in updated peer-reviewed papers to explore unanswered questions and gaps in the extant literature. Results from this qualitative multiple case study aligned closely to the research findings in the existing literature and in some cases extended the findings presented within the conceptual framework. I have detailed above the strengths and limitations of this study to encourage future researchers to validate these research findings using an appropriate quantitative research method for inquiry or to duplicate this study by utilizing qualitative research models which address subjects in various contexts.

Methodological Recommendation 1: Quantitative Validation

I believe that a quantitative research method such as a survey would provide additional insight into the transferability of my exploration into the daily experiences of older workers in a technology infused workplace. Longitudinal studies that examine how a person's job characteristics change over time would prove beneficial in understanding how age and job characteristics interact (Truxillo et al., 2012). Despite the fact that

several portions of my study provided vigorous results that coincide among the participants, the strength of their voices may alter based on workplace locations. A grander quantitative study might substantiate those discrepancies and similarities causing various components of my study to change.

Methodological Recommendation 2: Qualitative Replication

The utilization of the multiple case study method is encouraged for future research of this study to discover how research findings differentiate among older workers in technology infused workplaces. For instance, job crafting might allow older workers to adjust to the characteristics of their jobs as they see fit (Perry et al., 2012). In the same way, a related study could be conducted among older workers in technology infused workplaces which investigates not only the differences in the technology gap, but also the processes by which the technology gap has developed among multiple generations in the workforce (Costanza & Finkelstein, 2015).

Recommendations for researchers. My study is significant for researchers in meeting the goal of extending the conceptual framework of the study by offering original, qualitative data to, first, the selection-optimization-compensation framework for successful aging (Baltes & Baltes, 1990), which "builds on the assumption that individuals encounter certain opportunities as well as limitations in resources which require them to make choices regarding the allocation of those resources" (Ng & Law, 2014, p. 3). Secondly, additional qualitative data may add to the age-inclusive training design framework (Williams van Rooij, 2012), which indicates that critical to the design process of HR training driving aging workers' improved performance and productivity is

a solid understanding of the learner's work experiences with emerging technology. The results yielded from this research can be utilized by future researchers to generate new knowledge regarding the generational divide in the workplace and increasing productivity of older workers in technology-infused organizations.

Because of the ever-changing demographics and the increasing number of adults working past traditional retirement ages, a boost of awareness has been created regarding the importance of developing and training older workers (Kraiger, 2017). Future researchers may want to focus on the impact of training methods provided by HR that are based on ill-defined ideas with reference to the changes in the modern workforce. Technological developments are needed to leverage the strengths of older workers that offset their weaknesses to improve their well-being and increase organizational productivity (Tams & Hill, 2017). Research is needed not only to determine how technology influences employee engagement and effectiveness, but how to effectively create norms in the workplace (Colbert et al., 2016). Based on participant responses, most of the older workers in my study were experiencing or had experienced an overwhelming sense of anxiety while trying to remain abreast to the new technological shifts in the workplace.

While it is possible that individuals can be conditioned to utilize technology, there are additional changes needed to modify the usage behavior (Colbert et al., 2016). Yet, most of my participants discovered limitations when accessing technology as a means of training protocol in the workplace. Although offered, technology training and updates are not a requirement in the workforce and are deemed as optional leaving it solely to the

individual's discretion. Different jobs and professions require very different levels of job characteristics, as such future research should examine whether those who are similar in age in different professions or industries may experience their jobs differently (Truxillo et al., 2012). Moreover, the SOC theory (Baltes & Baltes, 1990) states that older workers are less likely to choose job characteristics that are associated with high level demands because it would limit their performance. Failing to choose job characteristics that are associated with high level demands, creates a growing trend for the older worker to experience ageism and retire early for fear of the lack of productivity in the workplace. Ageism is not only an internal experience, it is manifested in various settings and contexts, and yet older workers may feel the need to increase their commitment to their career to contradict the stereotype of age-related decline in motivation at work (Ayalon & Tesch-Römer, 2017).

Recommendations for practice. Stake (2010) wrote that professional practice relies heavily on qualitative research and no matter how refined the research design used, researcher recommendations for professional practice must be reached through interpretation. Those interpretations will depend on the experience of the researcher, the experience of the samples, and the experience of those to whom the study results will inform and the personal experiences of the researcher within an organizational setting (Stake, 2010). My own experience with older workers in my professional setting and my own stage of career provided an experiential lens through which to also evaluate the findings of the study and what significance my research results may hold for human resource managers. Considering a job design from a different perspective could yield an

opportunity to improve work performance and the engagement of the worker in an organizational setting which could provide support for the preparation of retirement, transitional roles, or bridge employment (Truxillo et al., 2012).

Organizations need recommendations on management practices that will effectively support this employee group's adoption of ever-evolving ICT devices in today's organizations (Rietzschel et al., 2016). Given the trend of an aging workforce, it is likely that there will be an increase of impact in the organization regarding societal demands (Vasconcelos, 2018) as technology continues to develop and evolve gaps that are needed to survive and thrive in a technology dominated workplace rely on training programs (McCausland et al., 2015). Further research should be conducted to determine how generational differences and stereotypes in the workplace play a pivotal role in the lives of an older worker. It is believed that aging may have a negative impact on productivity and that the recommendations for HR managers to create a broader understanding of the daily experience of an older worker are pivotal in technology infused workplaces.

Implications

Positive Social Change

The results of the current study are potentially beneficial for the older worker, their families, society, and the economy. The findings of this study contribute to the field of knowledge in the areas of ageism, productivity, technology infused workplaces, and the older worker by exploring the daily experiences of the older worker in a technology infused workplace based on training and productivity. This current study could externally

affect research in any technology infused workplace where older workers are prevalent along with societal research areas and researchers in an attempt to create the study for transferability purposes.

My research reveals ageism is still evident in the workplace, and it would be interesting to identify the programs and policies implemented towards fulfilling the needs of the older worker (Vasconcelos, 2018). The current study offers insight into how learning, development, and the incorporation of new tasks provided by HR may unveil positive relationships with both work engagement and employability (Veth et al., 2017). A better understanding of the older worker and their daily experience can help organizations understand the relationship between age composition of the workforce and technology and the importance of its adaptation (Meyer, 2011).

Individual level. My study offers insight on how older workers adapt to technology in technology infused workplaces, which may attribute to ageism and the effects of productivity in the organization. In most cases, the inability to adapt to ever changing technology in the workplace contributes to early retirement options creating a decline in organizational commitments. However, older workers may decide to increase their commitment to their career to contradict the stereotypes attributed with ageism to contradict the age-related decline in motivation at work (Desmette & Gaillard, 2008). The ways in which older workers use technology in the workplace will continue to develop and change (Colbert et al., 2016). Understanding the relationship between the age composition of the workforce and the adoption of technology is important for small and medium-sized firms (Meyer, 2011).

Organizational level. My study's findings provide suggestive evidence for older workers to remain abreast of the technology advancements in the workplace by utilizing resources offered by employers to remain prevalent in the workforce. Meeting job demands involves updating skills and using strategies to sustain adequate performances while preserving status quo in association with a tendency to try and get by with skills existing while trying to stay away from challenges associated in the workplace (Taneva & Arnold, 2018). It is increasingly paramount to understand the functions in the workplace and what facilitates the factors regarding their job performances as employees age and work well into retirement age and beyond (Baltes et al., 2014). The levels of job satisfaction and engagement are considerably higher for the older worker if their occupational well-being is successful (Zacher & Schmitt,2016). This may prove beneficial while younger workers enter the workforce and as older workers prepare to exit so that HR managers properly prepare to implement plans that will help assist with the transition of technology use in the workplace. In addition, the transition should include proper trainings that will allow the older worker to become well versed with the specific use of tools to help increase productivity. By creating accommodations, employers will be better positioned to reap the benefits of employing older workers (Clark & Morrill, 2017).

Methodological, theoretical, and/or empirical implications. This study is framed by three key concepts that focus on the challenges that older workers face in technology infused workplaces: Baltes and Baltes' (1990) concept of the selection-optimization-compensation framework for successful aging, "builds on the assumption

that individuals encounter certain opportunities as well as limitations in resources which require them to make choices regarding the allocation of those resources" (Ng & Law, 2014, p. 3), and Williams van Rooij's (2012) concept of the age-inclusive training design framework, which indicates that critical to the design process of HR training driving aging workers' improved performance and productivity is a solid understanding of the learner's work experiences with emerging technology. The purpose of this qualitative exploratory multiple case study was to gain a deeper understanding of older workers' daily experiences with ICT adoption in technology-infused workplaces.

The findings of this empirical investigation are aimed at increasing knowledge on older workers and technology infused workplaces, and to explore qualitative data to align with the study's conceptual framework. The empirical evidence presented in this multiple case study provides a reliable method of research for data collection that involves the older worker and a technology infused workplace daily experience.

Conclusions

Authors have published a plethora of research regarding older workers in the workforce, yet the adaptation of technology by the older worker in a technology infused workplace has been a scarce topic. Since organizations progressively rely on technology to increase work performances, older workers tend to shy away from using technology creating negative impacts for organizations (Tams et al., 2014). Due to the increasing prevalence of technology and its influences, major changes have occurred in the way that we live our lives (Colbert et al., 2016). Yet, researchers are surprised by the minimal

amount of information available on training resources available in the workforce for the older worker to become acclimated with ever changing technology.

Even though older workers are not always skilled, companies are able to select and retain excellent employees among this group resulting in higher performances of the older worker (Lee & Yang, 2016). By treating older workers as an asset, human resource policies should focus on being creative and open minded when processing demands from them (Vasconcelos, 2018). By doing this, stereotypes are dismantled in the workplace while diminishing stress and ageism on the older worker. Since different jobs and professions require different levels of characteristics, it would behoove employers to examine how certain jobs may allow for workers of different ages to craft their jobs while aging in the workplace (Truxillo et al., 2012). Ultimately employers must consider the advantages of retaining and hiring older workers, as employers can either assist or restrict an older worker's ability to remain on the job (Clark & Morrill, 2017).

The daily experiences of an older worker in a technology infused workplace was explored in the present study. The study promoted social change by highlighting the issues of ageism and stereotypes that are being created in the workplace daily due to an age gap in the adaptation of technology. The individuals in the study played an important role in understanding the daily experiences of older workers in a technology infused workplace. They provide an in-depth insight into their insecurities to maintain their status in the workplace for fear of losing their positions to a younger counterpart. Although, many of the obstacles that the older worker may face are contingent upon proper training and accessibility, they continue to persevere by doing what it takes to remain relevant in a

younger generated workforce. A worker should be considered an aging worker from the time in which they enter the organization and begin working, which helps to diversify the organization creating stronger bonds and integrity throughout the workplace. Although older workers continue to make small strides towards becoming an inclusive part of technology infused workplaces, further research is needed to create an inviting environment where older workers feel welcomed and important. Because of the brave stance by the participants of this study, future independent scholars have a strong and effective platform to continue to seek and explore the daily experiences of the older worker in technology infused workplaces around the nation.

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Appendix A: Recruitment Letter

Recruitment Letter to Participate in the Study

Hello, I am a PhD. student at Walden University and I would like to invite you to participate in my research about the daily experience of an older worker in a technology infused workplace. The purpose of this study is to gain a deeper understanding of older workers' daily experiences with information and communication technology (ICT) adoption in technology-infused workplaces. I believe that your daily experience would be a great contribution to the study. As such, I am reaching out to you to see if you might have an interest in participating in the research.

The study is important because the findings may provide older workers with ways to adapt in technology infused workplaces. The impact of this study may result in providing innovative ways for an older worker to utilize information and communication technology as a contributor with maintaining productivity in the workplace. This study will benefit both the employer and the older worker while increasing important knowledge of technology use in the workplace throughout society.

If you are interested in being a part of this study, please look over in detail and return the signed consent form which is attached to. If you would like to request additional information, you may reply to.

Thank you in advance for your consideration.

Respectfully,
Julie Francis-Pettway

Appendix B: Interview Protocol

Interview Details:

Participant's Code Name _____
Interview Date/Time _____
Age_____ _____
Gender _____
Years at your present position _____
Industry Sector: _____

Preliminary Actions:

1. **Explain the purpose of the interview. Provide a short background of the researcher's connection to the study**.

   The purpose and goal for the study is to explore the daily experiences of older workers with ICT adoption in technology-infused workplaces.
   As you may know, the older worker is defined as those 55 years of age or older, and tremendous changes are taking place in the work environment and organizational structure because of advanced technology. Although beneficial, modern information communication technology (ICT) has created challenges in the workforce for the aging worker. This study is about exploring the daily experiences of an older worker and possibly create ways to diminish the technology gap present in the workplace.

   I am conducting this study as part of my doctoral program. I have a background in Employment Services, Human Resources, and Leadership and Organizational Effectiveness, but my experience has no bearing on my role as a researcher in this study.

2. **Explain participant rights**.

   Your response to my invitation to participate and your signature on the consent form, will indicate your formal consent for this interview. Please note that all information will be held in the strictest of confidence. This interview will also be digitally recorded. I will transcribe the interview immediately upon completion. The data collected from this interview will only be viewed by me and my dissertation committee. Please note that your involvement is voluntary and you may choose not to answer any of the questions or withdraw at any time. Also, you have the option to stop the interview at any time. The interview should take no more than an hour to complete. Thank you for agreeing to participate. Please sign the consent form.

Interview Questions:

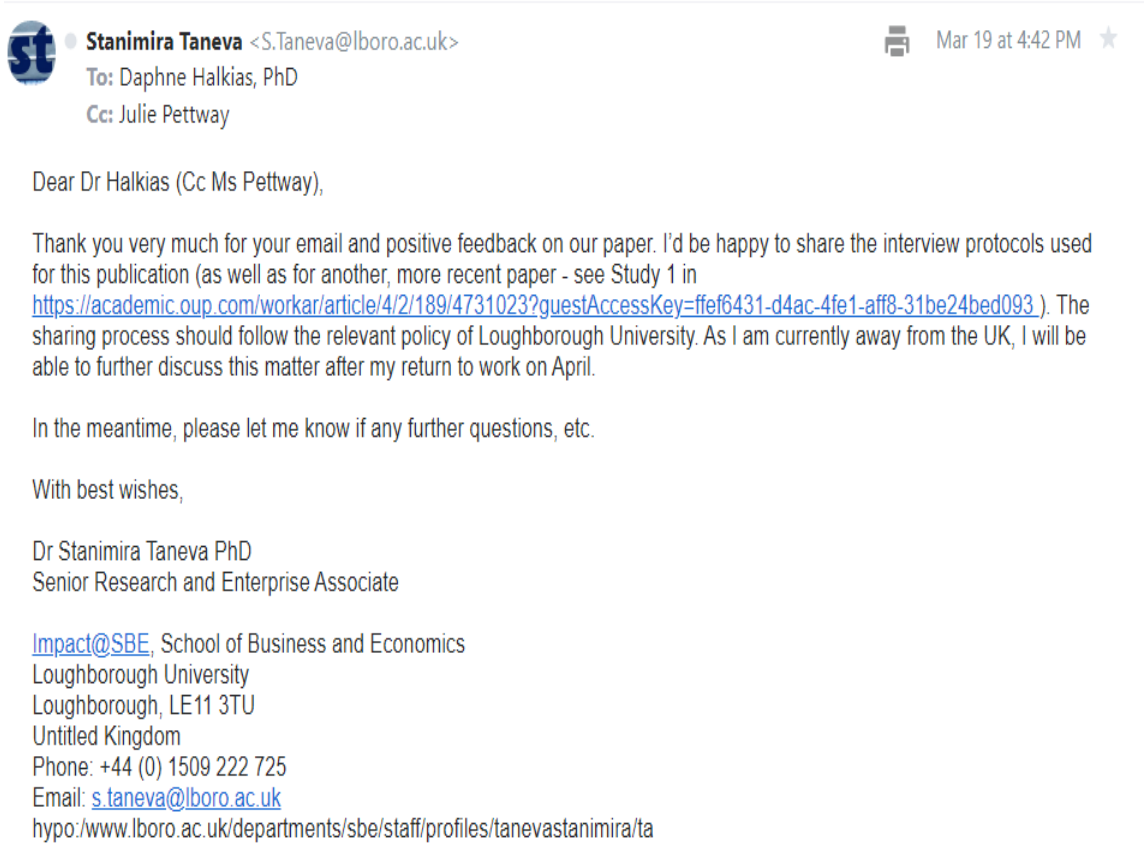
1. What are the key challenges for you as a mature worker in the workplace?
2. How, if at all, have you changed the way you do your job as you have got older?
3. How, if at all, has your capacity to do your work changed as you have got older?
4. What, if anything, helps you feel energized at work?
5. What kind of training to update current job skills has been offered to you by your employer?
6. What kind of training to learn new IT skills has been offered to you by your employer?
7. How would you describe your experience as an older worker in a workplace dependent on technology?
8. In what ways does your employer recognize the role that mature employees can play in daily work life at your company?
9. What kind of feedback do you receive from your supervisor/manager on your role as an older worker in your company?
10. What financial incentives does your employer offer older workers to remain in the workforce instead of retiring?
11. Is there any other experience you wish to share with me at this time as an older employee in a workplace dependent on technology?

Debrief:

Thank you for assisting me with this research study. I will contact you via email once the transcription from our interview is finalized. I will provide a summary of the interview with my interpretation of your experiences, and I would like for you to review the summary as a confirmation that I have captured the essence of what you have shared with me. If any discrepancies are found, I will correct the interpretations. Do you have any questions? Please contact me if you have any questions.

Thank you!

Appendix C: Permission to Use Interview Protocol



Stanimira Taneva <S.Taneva@lboro.ac.uk>
Mar 19 at 4:42 PM
To: Daphne Halkias, PhD
Cc: Julie Pettway

Dear Dr Halkias (Cc Ms Pettway),

Thank you very much for your email and positive feedback on our paper. I'd be happy to share the interview protocols used for this publication (as well as for another, more recent paper - see Study 1 in https://academic.oup.com/workar/article/4/2/189/4731023?guestAccessKey=ffef6431-d4ac-4fe1-aff8-31be24bed093). The sharing process should follow the relevant policy of Loughborough University. As I am currently away from the UK, I will be able to further discuss this matter after my return to work on April.

In the meantime, please let me know if any further questions, etc.

With best wishes,

Dr Stanimira Taneva PhD
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Resource:

Taneva, S. K., Arnold, J., & Zacher, H. (2018). Thriving, surviving and performing in late career: A mixed-method study of pathways to successful aging in organizations. *Work, Aging and Retirement*, *4*(2), 189–212. doi:10.1093/workar/wax027