THE RELATIONSHIP BETWEEN WELL-BEING AND TECHNOLOGY AMONG SENIOR

CITIZENS IN INDIANA

by

Treg Hopkins

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University

2018

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ABSTRACT

Across America technology has become an ever present requirement for day-to-day living.

Senior citizens for this study were those who were 50 years of age and older and were often

hindered in understanding and using technology. The purpose of this research study was to

determine if there is a statistical significant correlation between the number of technology classes

a senior citizen takes and general well-being. Senior citizens were surveyed to determine if

understanding of technology changed level of well-being. A paper survey was used with a

convenience sample of seniors who take technology based courses through an organization

designed to teach the aging population how to use technology. Well-being was measured using

two different instruments. The first was the Quality of Life and Enjoyment and Satisfaction

Questionnaire- Short Form. The second was the Warwick-Edinburgh Mental Well-being Scale.

A Spearman's *rho* correlation was used to determine if there is a relationship between well-being

and the number of technology courses taken by seniors. The researcher found that there was a

statistically significant moderate-to-strong positive correlation between the number of

technology courses completed and overall score on the Quality of Life and Enjoyment and

Satisfaction Questionnaire- Short Form. The researcher found there was a statistically

significant moderate-to-strong positive correlation number of technology course completed and

overall score on the Warwick-Edinburgh Mental Well-being Scale.

   Keywords: senior citizens, technology, well-being, quality of life

Dedication

This dissertation is dedicated to Michelle Clemons. Thank you for 16+ years of pushing me to be a better version of myself, always believing in me to achieve things I never thought were possible, and telling me, I could do it even when you had your doubts. In the beautiful adventure of life, I am thankful to have found a F(f)riend like you.

Acknowledgments

I am thankful for the strong system of support I have found throughout my life. God has guided my mind, hand, and spiritual life in a direction I could have never dreamed of on my own.

- To Dr. Ellen Black, you have been an inspiration to me since the day I first met you. We connected instantly. You have offered such a kind, accepting, and encouraging spirit I will long cherish.

- To my mother Terry, who has always believed I could do anything, who laughs at my crazy ideas and then supports me achieving them, who consistently molded me into the man I am today, I thank you.

- To my F(f)riend Matthew, you have challenged me to be a better man, to explore the world with clearer eyes, and to think higher of myself and others in so many ways.

- To my wonderful staff who support me daily, build my confidence, and have been a constant support on a regular basis, thank you.

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List of Abbreviations

QLESQ-SF- Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form

SPSS- Statistical Analysis Software Package

WEMBWS- Warwick-Edinburgh Mental Well-being scale

CHAPTER ONE: INTRODUCTION

Overview

Technology is a common part of life in today's modern society. Children often begin using technology before entering elementary school. Education has embraced technology as an educational enhancement tool allowing students to learn in a manner in which they feel comfortable. For those over 50 years of age, technology has changed dramatically since last being enrolled in school. Today, senior citizens are finding creative ways to blend technology into daily routines. This chapter will discuss the historical context of technology for the aging population, problem statement, purpose statement, significance of the study, research questions, and definitions which will assist the reader in understanding the contents of the research.

Background

Aging is a process that cannot be avoided. The average lifespan for an American today is more than 78 years of age (Lichenstein, 2013). Many Americans over the age of 50 have little to no training when it comes to understanding and using technology (Lee, Czaja, & Sharit, 2009). For senior citizens, this lack of knowledge can cost time, money, and career opportunities (Baecker, Sellen, Crosskey, Boscart, & Barbosa, 2014). Both the Social Security Administration and the Veterans Administration offer forms for beneficiaries that are no longer available in a paper format and must be accessed and/or completed online (HSPD-12, Implementation Status, 2013). Gaining the skills needed to operate in a modern society is not easy, in fact, senior citizens report a fear of technology is greater than the fear of being murdered (Birkett, 2012). One of the problems with understanding how technology impacts senior citizens is that the term senior citizen is not well-defined when it comes to chronological age. Without a consistent use of age, large portions of the population may end up being underserved. The United Nations does

not have an official age for senior citizens but generally uses the age of 60 years old to define the population (El-Attar, 2005). Meanwhile, the United States considers retirement age to be those who are 65 years of age and older (Lynch, 2009). The American Association of Retired Persons now known simply as AARP views senior citizens as those residents over the age of 50 (Lynch, 2009).

Starting around the age of 50 years old people begin to face challenges understanding and using technology (Larsson, 2013). Just as technology has continued to advance, so too has the gap between older Americans and societal demands when it comes to using technology (Lundt, 2002). As the gap grows larger, senior citizens continue to be left behind. Senior citizens often lack the ability to use and adapt technology into daily living (Kolodinsky, 2002). Many turn to technology training in order to enhance understanding and increase overall skillset to accommodate for changes technology has caused in daily living (Cheryl, 2008).

Just as technology continues to increase at a rapid rate, the United Nations projects that by 2025, 1 in 3 people will be 60 years of age or older (Xie, 2003). As people continue to live longer, many people may discover a lack of significant funds for retirement or an inability to live off of social security income. Employment rates for older workers are expected to increase to nearly 59% over the next two decades (Lee, Czaja, & Sharit, 2009The need to understand technology may make it difficult for senior citizens to stay relevant in the workplace.

Many retired professionals with higher educational levels continue on to work as adjunct faculty members at colleges and struggle with using the grading system and other computer-based technology required (Van Der Kaay & Young, 2012). Less demanding jobs may still require an employee to use a computer to keep track of hours for payroll purposes.

Many senior citizens have discovered finding a job may prove difficult as applications for employment are often only available online (Lee et al., 2009). It is necessary now to find credible ways for senior citizens to both learn technology and measure how understanding impacts daily lives. Having basic technology skills could very well determine if the person is employable or not. Without access to employment, many senior citizens may not be able to afford the basic necessities for survival.

Two main theories were used to explore the significance of the relationship between seniors understanding technology and general well-being. Andragogy is also known as The Adult Learning Theory and was developed my Malcolm Knowles in order to better understand how adults and children learn differently (Knowles, 1970). Andragogy is often known as both the art and science of how adults learn (Loeng, 2010). Pedagogy is the format that younger students utilize as a learning the learning theory, but for adults, andragogy is its equivalent (Boydell, 2015). Andragogy was used to better understand how senior citizens are able to learn and apply technology to daily living. Andragogy lists five Assumptions of Adult Learners (Loeng, 2010):

1. Self-concept- As a person matures their self-concept moves from one of being a dependent personality toward one of being a self-directed human being

2. Adult Learner Experience- As a person matures they accumulates a growing reservoir of experience that becomes an increasing resource for learning.

3. Readiness to Learn- As a person matures their readiness to learn becomes oriented increasingly to the developmental tasks of the persons social roles.

4. Orientation to Learning- As a person matures their time perspective changes from one of postponed application of knowledge to immediacy of application, and

accordingly their orientation toward learning shifts from one of subject-centeredness to one of problem centeredness.

5. Motivation to Learn- As a person matures the motivation to learn is internal.

The next theory that was used in this study was the Well-Being Theory which is better known as the PERMA model (Seligman, 2011). When it comes to the general well-being of individuals it is important to realize that well-being is not made up simply by one component but by many characteristics of life (Baltzell, 2013). For senior citizens, it can be difficult to understand personal well-being because it goes beyond the question of how one is doing (Baltzell, 2013). Like Andragogy, there are five characteristics measured by the PERMA model when it comes to well-being (Huber, 2010):

1. Positive Emotion- In order to experience well-being we must have positive emotions in our lives. Emotions may include happiness, connectedness, hopefulness, and love

2. Engagement- Becoming truly engaged in a situation or project creates FLOW. Flow states act as a constant state of blessing.

3. Relationship- Understanding different social relationships and being able to evaluate them on quality and importance.

4. Meaning- Being able to attach value and purpose to a particular situation.

5. Accomplishment/Achievement- Recognizing whether something was successful or not given a predetermined outcome hypothesis.

Combined, these theories provided the researcher the needed concepts and measurements for a successful study. Andragogy helped connect seniors to the material, while the PERMA model established well-being among senior citizens. Both tools were integral in establishing

whether senior citizens well-being was impacted by the number of technology courses the senior citizen completed.

Problem Statement

Research on senior citizens learning and using technology is still emerging. Although it is widely recognized that technology is changing at an ever increasing rate, how seniors use technology is finally being understood. Due to a high demand for technology in today's world the literature suggests senior citizens need to learn basic computer, tablet, and cell phone skills (González, Ramírez, & Viadel, 2015).

Seniors must learn these basic technology skills or might struggle to function in a modern society. One option is for senior citizens to take a class designed to teach skills related to how to better use technology. Once senior citizens have learned technology skills and are able to better use incorporated technology, it should be determined how technology may impact lives. The problem is more research is needed to determine if well-being levels are impacted by formal training for seniors on how to better use technology (Heaggans, 2012).

Purpose Statement

The purpose of this correlational study was to determine if relationship existed between the number of technology courses senior citizens completed and well-being. This relationship was not studied before and therefore, at the suggestion of past research, the researcher looked closely to determine if there was a relationship between the two variables for senior citizens. In order to establish if there was in fact a relationship between the two, a bivariate correlation was used.

Senior citizens who take technology based courses through an organization designed to teach the aging population how to use technology better were surveyed at the conclusion of class

to measure well-being. This included between 100-200 senior citizens residing in the state of Indiana. For purposes of this study, the predictor variable was the number of technology classes completed by senior citizens. The dependent criterion variable was the well-being of those seniors as measured by two different instruments. The first instrument was the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form. The second instrument was the Warwick-Edinburgh Mental Well-being Scale.

Significance of the Study

Well-being is an important aspect in determining the happiness, resilience, and overall wellness of an individual (Boydell, 2015).   This study was important as senior citizens continue to be required to interact with technology on a daily basis and overall well-being could be impacted by the demands of technology (Boydell, 2015). As senior citizens begin seeing every aspect of =life changing as a result of technology, well-being must be studied.

In addition, technology has to be user friendly for senior citizens by continuously evolving with new and improved ways for the senior citizen better grasp technological concepts and understand the positive impact technology has on overall quality of life (Heaggans, 2012). Many seniors are turning to technology specific classes in order to stay up-to-date and understand technology. Perhaps the quality of life is impacted by the number of courses the senior citizen completes. Lastly, attitudes among senior citizens have been measured regarding understanding of technology. This study helped build an understanding related to if technology use/understanding impacted senior citizen well-begin (González et al., 2015). If senior citizen well-being was impacted by the use of technology, not understanding technology therefore was likely impacting the senior citizens general well-being.

This research moved the field forward by building an understanding of how senior citizens engage with technology in attempts to improve quality of life and general well-being. The field of study was an emerging field as research into how technology impacted the elderly on a day-to-day basis was quite limited.

Research Questions

The research questions for this study were: **RQ1:** Is there a relationship between the number of technology based courses senior citizens have completed and their well-being levels as measured by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form?

RQ2: Is there a relationship between the number of technology based courses senior citizens have completed and their well-being levels as measured by the Warwick-Edinburgh Mental Well-being Scale?

Definitions

1. *Senior Citizen* – For the purposes of this study, a person who was 50 years of age and older and self-identified as a senior citizen (Lee et al., 2009; Lichenstein, 2013).

2. *Well-being* – An important aspect in determining the happiness, resilience, and overall wellness of an individual (Boydell, 2015).

3. *Technology* – Physical components or equipment such as computers, tablets, cellular telephones, and other high tech devices (González et al., 2015; Heagens, 2012).

4. *Andragogy* – Also known as The Adult Learning Theory, developed by Malcolm Knowles to build an understanding of how adults and children learn differently (Knowles, 1970).

5. *Basic Technology Skills-* The ability to access the internet, send an email, and make a phone call using an electronic device.

6. *PERMA*- A model which is also known as the well-being model and helps determine an individual's general well-being utilizing five characteristics (Seligman, 2011).

CHAPTER TWO: LITERATURE REVIEW

Introduction

Senior citizens throughout the United States are finding that technology is becoming a part of daily life (González et al., 2015). From banking to medical records, grocery shopping to pet food, technology is providing senior citizens with new ways of obtaining necessities without ever leaving the home (Brink, 2001; Friemel, 2016). Today's senior citizens did not grow up with computers in the home or phones in pockets. Understanding how to use technology safely is becoming a regular part of life for those fifty years of age and older (Boydell, 2015). Adults may find it challenging to find the right resources needed in order to master the skillset necessary to utilize the technology that would help improve life and general well-being (Huber & Watson, 2014).

There are many avenues senior citizens may take to gain technology skills. Technology training is often first viewed as an opportunity to connect an older generation family member with a younger family member (Smith, 2014). However, many seniors report family members tend to take over rather than walk through the material (Brookfield, 2005; Smith, 2014). This leads senior citizens to begin looking at more formal training such as taking a computer or phone course at a local library, retirement community, or even through the local community college (Van Manen, 2015). These classes are typically affordable options but may not specifically be designed to teach an aging population (Chan, Haber, Drew & Park, 2016).

Conceptual or Theoretical Framework

Relevant Pedagogy

Students have been learning utilizing the theory of pedagogy for hundreds of year (Csibra & Gergely, 2011). Pedagogy was created by Johann Friedrich Herbart as a theory that worked on creating the best teaching methods possible (Brookfield, 2005; Findsen, 2007; Ozuah, 2016). Pedagogy was focused on understanding how to best develop the child utilizing a variety of different learning goals set by the student (Ozuah, 2016). There are various methods of teaching from a pedagogical standpoint, one such theory is the Socratic Method which is often cited as the most popular use of pedagogy (Holmes & Abington-Cooper, 2000; Ozuah, 2016; Sandlin, Wright & Clark, 2011). Using the Socratic framework means the instructor would build students understanding through a series of questioning using open probes to trigger class-wide participation (Findsen, 2007).

Pedagogy and Adults

Adults are able to also learn utilizing a form of pedagogy (Holmes & Abington-Cooper, 2000). However, some adults struggle to find a pedagogical format to best suit an adult learning style (Parker, Maor, & Herrington, 2013). Adults learn differently than children and therefore require some adaptation toward understanding (Parker et al., 2013). This results in the adult's tendency to struggle in the traditional classroom (Findsen, 2007). Many colleges are offering adult programs in the United States that are evening programs for full-time working adults (Monk, Campbell, & Smala, 2013). The methodology used in the adult learning classroom is often project based and is still not properly equipped to handle a student over the age of fifty (Monk et al., 2013).

Unnatural Adaptation

For adults to learn in the standard classroom, adult learners must find a way to adapt

needs to the method of delivery (Csibra & Gergely, 2011). Many adults may find it surprising

the level of technological understanding required in the classroom to complete basic assignments

or even the course reading (Parker et al., 2013). It is typical in today's classroom at all levels to

require students to submit homework online (Parker et al., 2013; Van Manen, 2015). This

requirement may seem simple for those who use the computer daily; however, for the large

majority of adults over fifty, internet usage has not made its way into everyday life. Technology

use among senior citizens is on the rise and it is predicted that the majority of United States

residents between the ages of 50-70 will have a smart phone in the next five years (Baecker,

Sellen, Crosskey, Boscart, & Barbosa, 2014). This is causing senior citizens to increase the level

of demand for technology training (Baecker et al., 2014). When entering the classroom, seniors

citizens must make adaptations to both learning and lifestyle in order to participate in the class

itself. As senior citizens struggle with the pedagogical methods, children through young adults

tend to thrive in such an environment (Brookfield, 2005).

Pedagogy in Children

For younger students, pedagogy causes the student to ask questions and critically think

through possible solutions (Csibra & Gegley, 2011; Holmes & Abington-Cooper, 2000).

Children are able to focus interest levels on curiosity, whereas adults must have a set goal in

mind in order to accomplish a task (Bernard & Scharf, 2007). In younger people, the brain is in

a constant state of question, answer, response, and repeat (Csibra & Gegley, 2011). This causes

the way in which children learn to be filled with experimentation, trial, and error. Adults on the

other hand tend to base learning on either experience or skillset (Sandlin et al., 2011). For children, it is easier to be able to quickly pick up on new concepts because of a lack of experience. Due to the lack of experience, children learn information without fighting through all of the content already stored in the memory because of past experiences (Parker et al., 2013). Children absorb new information as a way of gaining experience and therefore end up being more open to the unknown (Ozuah, 2016).

Natural Inclination

Unlike the adult learner, children have a natural inclination to utilize standard pedagogy and the variety of different methods only further stimulates the young mind (Monk et al., 2013). Children are naturally inclined to be inquisitive and to seek solutions. Adults more readily look at learning something new as a negative task (Holmes & Abington-Cooper, 2000). Children on the other hand are always learning new things and this behavior continues through the 20's and 30's as well due to demands for new job skills (Sandlin et al., 2011). Older adults tend to hit a period in their 40's and 50's where they stop being as interested in gaining new skills and find obtaining new skills more of an annoyance than a pleasure (Sandlin et al., 2011). This change in learning attitude occurs as pedagogy also begins to become more of a challenge to the adult learner (Ozuah, 2016).

Andragogy

As an alternative to pedagogy, andragogy is known as the adult learning theory (Loeng, 2010). This theory was popularized by Malcolm Knowles and was highlighted for understanding that adults learn differently than children (Knowles, 1970; Lee et al., 2009; Loeng, 2010). One of the main ways that adults learn differently in andragogy is the need for connecting to an overall goal (Hodgson & Kambouri, 1999). Without a connection to the goal the adult is trying

to learn, the adult will not value the material enough to absorb and retain the information (Van

Manen, 2015). Adults also tend to need more relevant and hands-on activities which can be

applied and practiced both inside and outside of the classroom (Sandlin et al., 2011).

For older adults who are no longer working, connecting the material to a goal for

achievement within the context of the material being taught might be more challenging (Friemel,

2016). This poses a problem for adults returning to college who may not find a need to

understand a general education subject such as philosophy or algebra (Huber & Watson, 2014).

Adults may find these courses unnecessary because the course is not directly connected to the

job or personal goal the adult learner is attempting (Huber & Watson, 2014). Adults also would

not function well in a class where the faculty either lectures or opens discussions. Adults need to

be able to relate the material first-hand which means being able to experience how it works, not

simply talking about how it may work in theory (Burmeister, 2012).

For adult learners, being project centered rather than content centered poses problems in a

traditional classroom (Levine, Lipsitz, & Linder, 2016). Many traditional classrooms require

faculty to cover a set amount of content and are regulated by publishers and accreditation

requirements (Reynolds & Hitchcock, 2014). These conflicts in delivery verses what is needed

in order to successfully understand the material cause adults to be intimidated in the classroom

and falsely believe the material is too difficult to learn (Gibson, 2016). Providing a better

learning environment for adults is the ultimate goal of andragogy (Knowles, 1970).

Blending the Classroom

For adults returning to the formal classroom after many years, the learner may be

surprised that it is not possible to learn utilizing the same tactics used previously in school

(Heaggans, 2012). Faculty should be aware of the needs of an adult student and find ways of

incorporating both andragogy and pedagogy into the classroom (Reynolds & Hitchcock, 2014).

Following the practices of andragogy allows adult learners to be able to share personal

experiences which also add to the potential for younger students to connect to the material

(Boydell, 2015). A multi-generational classroom can help all students understand the course

material at a deeper level and then apply it successfully (Huber & Watson, 2014). A formal

educational setting does not have to utilize one or the other, but a combination of both ensures all

students are being taught in the best way possible (Findsen, 2007). This of course requires

faculty to understand andragogy and how to best teach adults. Additionally, this will cause

faculty to prepare more activity-based lesson plans in addition to content based planning (Monk

et al., 2013).

Empirical Evidence

Adults who choose to take classes through a community college or public access course

will likely find themselves mixed in with a variety of ages. The faculty may even be years

younger than other students in the class leading to a general feeling that the older adult may in

fact be too old for the classroom (Gibson, 2016). Faculty should be aware of these concerns

ahead of time and should be prepared to make all students feel welcome and prepared for the

material (Reynolds & Hitchcock, 2014).

Teachers Perspective

Teachers will have a variety of feelings toward having adults in their classroom. For

some, older students may result in more responsible students (Reece & Walker, 2016).

Submitting homework on time, reading the course material, and participating in class may not be

as intimidating to an adult (Ross-Gordon & Murray-Johnson, 2015). Teachers will benefit from

the experience the adults bring to the classroom as well (Gibson, 2016). However, sometimes

this experience causes conflict because the experience is outdated and when shared with a group of people can raise questions to the validity of the course material (Gibson, 2016). For the most part, adults bring good questions and help younger students apply concepts (Reece & Walker, 2016). In the classroom, adults can be utilized to assist younger students and younger students are able to assist older students (Gibson, 2016). This form of learning is called interdependence and requires everyone in the classroom to help each other achieve goals (Downing, 2014). With all students and faculty sharing responsibility for the understanding of others in the classroom, teachers will benefit from having a blended classroom (Baltzell, 2013).

Young Adults Perspective

Younger students may feel frustrated having an older adult in the classroom (Chen, Kiersma, Yehle, & Plake, 2015). The older adult is likely to set higher expectations for the class by taking the work more serious than younger counterparts (Boydell, 2015). Additionally, adults tend to ask more questions in the classroom than younger peers (Koh, 2012). This causes some students to lose interest quickly because the younger students feels the topic is understood well enough to move on in the material, while the adult is still trying to figure out how to apply the material (Lee et al., 2009; Loeng, 2010). Although adults may slow down the pace of the classroom, the level of understanding experienced by both the adult and young adult is enhanced through content-based instruction which is then applied by the adult learner (Chen et al., 2015). Young adults may also find having an older generation student in the classroom is beneficial when help is needed (Ross-Gordon et al., 2015). At the same time, the younger student is able to help older students with technology and other classroom applications that are outside of the norm for older students (Chan et al., 2016).

Senior Citizens Perspective

For the adult learner, re-entering the classroom after many years away can be quite intimidating for a variety of reasons. Learning something new that is technology-based causes fears in a population who has little experience with technology (Smith, 2014). One misconception senior citizens often have is the cost of technology being high. In the past, computers were out of reach economically to a lot of people (Ijsselsteijn, 2012). Today, computers are relatively inexpensive and much of the fear can be removed (Ijsselsteijn, 2012). Once the equipment fear is removed, senior citizens are still left with concerns over using technology and understanding how to complete computer-based homework is a new challenge that senior citizens may not expect (Levine et al., 2016).

As adult learners experience the classroom for the first time in years, the students are likely surprised by the amount of work that is required to use a computer (Brink 2001). In nearly every subject, a computer is likely a required piece of equipment (Gibson, 2016). As adult learners gain computer skills, the ability to understand the concepts being taught in the classroom might still be impossible to learn without being exposed to real life examples and the opportunity to apply the new knowledge (Loeng, 2010).

Gaining self-confidence to ask questions in class that are relevant to applying the course material is an important step for the older student (Downing, 2014). Some students shy away from questioning as younger peers make older students feel self-conscious about asking questions that could delay the class (Gibson, 2016). The instructor must decide if the question is beneficial for all or if a conference should be held with the older student outside of class (Reece

& Walker, 2016). The solution is not always one-sided though, seniors can offer much in the way of transforming the classroom and should be embraced in the classroom (Chan et al., 2016).

Transforming Urban Schools

Since the early 2010's, schools across the country, mainly in urban school districts, have found ways of utilizing a student's inherent knowledge of technology and combining it with the elderly's desire to learn and understand how to better use technology (Blackmon, Boles, & Reddy, 2015; Christian et al., 2012). For the urban school district that often struggles with funding and staffing levels, the district may find having more adults present on campus is an advantage (Blackmon et al., 2015). The elderly, in exchange for lessons on technology from the younger students, provide tutoring in both English and Math to the younger students (Yoder, Larson, Washburn, Mills, Carter, Brausch & Lee, 2013). This again is a form of interdependence where everyone is working toward a goal by participating in helping each other achieve personal goals (Downing, 2014). This model of bringing community members into the public school creates more stability for both the elderly and younger students that typically would only occur outside of the classroom (Blackmon et al., 2015).

Younger Students Partnering with the Elderly

Younger students who are paired with the elderly get to practice being patient and calm (Christian et al., 2012). This changes the dynamic of school for many students who can suffer from great levels of anxiety as a result of the pressure caused in school (Yoder et al., 2013). Additionally, teaching someone older how to do something builds the self-confidence and eventually increases levels of self-esteem for the younger student (Bandyopadhyay, Dey, Bardhan, Banerjee & Das, 2015). With additional self-esteem and another positive adult relationship that cares about the students' success, the student is more likely to persist through

the educational environment as well (Downing, 2014). The same elderly person the younger student is helping is then helping the student in return, not just emotionally, but also academically (Blackmon et al., 2015).

As the younger student returns home from a day at school, there is one more positive adult relationship who is counting on them to make wise choices (Yoder et al., 2013). Children who have positive adult role models are less likely to suffer from depression and anxiety (Damerell, Howe, & Milner-Gulland, 2013). Students who are paired with an older adult respond differently around other older adults (Koh, 2012). Young students who participate in programs with the elderly gain a better understanding of the aging process and some of the limitations that may have otherwise been viewed as an annoyance (Damerell et al., 2013). Once students begin to apply the skills gained from helping the elderly, the younger students are then able to apply those skills outside of the classroom as well building a greater sense of community (Blackmon et al., 2015).

Elderly Students Giving Back

Like most adults who are trying to gain new skills, the elderly implore aspects of andragogy in order to find relevance in the material (Knowles, 1970; Loeng, 2010). In addition, senior citizens who feel they are contributing are more likely to accept help in return (Lee et al., 2009). In programs where the senior citizen is partnered with a younger student to peer tutor, younger students are more receptive when it is the students turn to teach (Chen et al., 2015). This causes both the senior citizen and the younger student to feel invested in the program (Koh, 2012). The elderly find value in giving back which makes the older student more likely to stay committed to the position not only as a tutor, but also as a student (Bandyopadhyay et al., 2015).

Senior citizens who have a primary goal of helping a student increase self-esteem are more patient with the younger student (Blackmon et al., 2015). A lack of patience is one aspect for both age groups that is often listed as a major source of frustration (Wong, Chen, Lee, Fung, &, 2012). Creating an opportunity for the senior citizens and the young students to switch roles throughout the day causes a greater sense of well-being as both parties care about the outcome of the other (Yoder et al., 2013). Senior citizens gain a better grasp of what is happening not just in the classroom but in the rest of the world as well (Wong et al., 2014). Many senior citizens face social problems such as isolation (Chan et al., 2016). Opportunities for community-based learning has a natural effect of increased socialization (Burmeister, 2012).

Reciprocal Learning

In the case of reciprocal learning, one party is just as valuable as the other party (Koh, 2012). The young students who are needing to advance english or math skills are equally in need as the senior citizen who is needing to advance technology skills (Bandyopadhyay et al., 2015). Gaining kills may be the initial goal but the major progress being made may actually occur from the increased social awareness and self-esteem more than tangible skills (Chan et al., 2016). Developing relationships was an unintended but welcome consequence reported by numerous programs implemented in the urban school setting (Bandyopadhyay et al., 2015; Blackmon et al., 2015; Chen et al., 2015; Christian et al., 2012; Dumerell et al., 2013; Koh, 2012).

Younger students and the senior citizens both reported learning something new out of the experiences with the multi-generational occurrences (Bandyopadhyay, 2015; Blackmon et al., 2015; Chen et al., 2015; Dumerell et al., 2013). In addition, in all cases the participants were surprised by the investment in the lives of multi-generational peers (Bandyopadhyay et al., 2015; Blackmon et al., 2015; Chen et al., 2015; Christian et al., 2012; Dumerell et al., 2013;Koh,

2012). Incorporating more programs like these in other areas could have the potential to create a culture of community based learning that enhances opportunities for both the younger population as well as the aging population (Blackmon et al., 2015). As senior citizens and younger students partner together, both the skills and generational gaps begin to tighten (Friemel, 2016).

Senior Population Growth

In the near future, the senior citizen population will practically double. By the year 2030, those over the age of 65 will make up more than 72 million in the United States' population ("Highlights from older Americans 2016: Key indicators of well-being," 2016). The single biggest source of income for future seniors will be Social Security Income (SSI) making up nearly 84% of the elderly's finances (Pang, 2011). Expenses will continue to rise as healthcare needs increase. For seniors who plan to continue living at home, expected expenses are around $13,150 making it possible for the senior to survive simply on social security payments ("Highlights from older Americans 2016: Key indicators of well-being," 2016). However, if the senior citizen faces any form of illness resulting in a long-term care facility, the senior citizen could pay more than $60,000 in health care costs ("Highlights from older Americans 2016: Key indicators of well-being," 2016). The well-being of the elderly will greatly impact the affordability of aging over the next 15-20 years (Pang, 2011). With the increase in population overall, in order for technology to remain viable, it must also increase the senior citizens ability to stay active and engaged (Sixsmith, 2016).

More seniors equal more health problems. As the aging population increases, the concerns of obesity, heart disease, and mental illnesses also increase (Tiernan, Lysack, Neufeld, & Lichtenberg, 2013). More seniors are staying active through retirement but declining health has created a demand for new forms of technology to help manage the aging population (Birkett,

2015; Theirnan et al., 2013). Technology in healthcare is already helping with early detection of diseases such as Alzheimer's disease and genetic testing can reveal other illnesses or diseases that may eventually be of concern as the person ages (Sixsmith, 2013). As technology integrates further into the lives of the elderly, common household tasks, medication reminders, video surveillance, and concierge style meals will take the senior citizen beyond the basic medical alert bracelet of the past (Brikett, 2015).

The technology behind the scenes of the senior citizens life work to diagnose and treat illnesses (Birkett, 2016). This technology does not require much knowledge or use from the senior citizen but rather from the caregivers, doctors, and physical therapists using the equipment (Sixsmith, 2013). The in-home devices however that may improve the general well-being and quality of life for a senior citizen who is hoping to stay at home rather than move into an independent care facility must be able to directly interact in some way with the technology itself (Sixsmith, 2015). Family members also may benefit from knowing and understanding the technology being used by a loved one (Tiernan et al., 2013). Remaining at home is a goal of many seniors (Birkett, 2015; Pang, 2011; Tiernan et al., 2013). One in six seniors will age in a retirement community or nursing care facility simply because family is unable to provide the level of care needed or because finances make it challenging to hire the in home care and assistance required to live an independent life ("Highlights from older Americans 2016: Key indicators of well-being," 2016). With the help of technology, more senior citizens may be able to remain at home and live an independent life with great support remotely (Birkett, 2011; Sixsmith, 2013). Remote support is often less invasive than care by a health service provider (Birkett, 2015). Seniors who want to stay in the home for as long as possible will find embracing

technology may cause some confusion at first, but once learned may assist the senior in ways the senior citizen did not realize were possible (Birkett, 2015; Sixsmith, 2013).

Related Literature

People that have grown up with technology are from the group in society known as millennials (Thompson, 2013). Millennials grew up always having access to smartphones, computers, tablets, and technology being integrated into the classroom (Thompson, 2013). The previous generation is known as Generation X and attended college and also work in environments where technology is a part of daily life (Bayne & Ross, 2007). People from both Generation X as well as millennials have always known technology and are considered digital natives as a result (Bayne & Ross, 2007; Emanuel, 2013; Thompson, 2013). Although both generations continue to gain new technology skills, the foundation of daily technology use is embedded into the already busy lives of these two generations (Thompson, 2013; Vodanovich, 2014).

Digital natives expect life to become more technical (Emanuel, 2013). There are mixed opinions on if technology is making life more or less complicated (Bayne & Ross, 2007; Stoerger, 2009; Vodanovich, 2014). Nonetheless, technology will continue to advance and digital natives will endure a different aging process than the current baby boom generation (IJsselsteijn, 2012). As technology makes its way into homes, offices, and vehicles, those who do not have a good grasp of technology may feel left behind and disconnected from society (Smith, 2014). For senior citizens, there is already often a feeling of being disconnected due in part to peers moving into retirement communities and declining health that prevents senior citizens from maintaining the same level of social activity (Burmeister, 2012; Van Manen, 2015).

Shortcomings

Digital natives fail to recognize how difficult technology use can seem to those who did not grow up using computers, smartphones, and tablets (Elliott, 2013). In addition to being adept at using technology, it is reported that more than 60% of technology users report some feeling of addiction toward technological devices (Elliott, 2013). The reliance on technology is showing an impact on social skills as well (Bayne & Ross, 2007). Digital natives are more likely to engage in online conversation or through text message, photo sharing applications, or social media than in face to face communication (Vodanovich, 2014). Millennials specifically may lack eye contact when speaking or have limited knowledge of in person networking as a result of a dependency on technology (Yong & Gates, 2014).

Teach Back

Digital natives may not feel comfortable in front of a large group of people due to the social awareness aspects that seem to be missing from the generations which group up with technology as part of daily life (Stoerger, 2009). In smaller groups, the digital native is able to slow down from the fast-paced life enough to make a connection with an elderly peer (Kinash, Wood, & Knight, 2013). One-on-one opportunities are better for the digital native to process the stimuli in a more regulated environment (Thompson, 2013). Removing fear and social anxiety is the first priority for someone who is dependent upon technology as the primary source of communication (Chan et al., 2016).

Digital Immigrants

On the receiving end of this socially awkward exchange of information, the digital immigrant is someone who grew up without computers (Livine et al., 2016). Many digital immigrants are lumped in with the Baby Boomer or Greatest generation, although some who

identify as Generation X also identify as being a digital immigrant (Baynes & Ross, 2007).

Digital immigrants were more likely to take a typewriting class than a computer class and may

share some of the same basic skills to use a computer, but are held back by a limited knowledge

and understanding of technology (Emanuel, 2013). Many digital immigrants have a desire to

learn how to use modern technology, but a fear of actually using technology (Stoerger, 2009).

Fear

Senior citizens report the main concern over using the computer is fear (Chen et al.,

2015). Fear may exhibit itself in different ways and have different causes for the digital

immigrant (Kinash et al., 2013). The first way is through avoidance (Kinash et al., 2013). When

fear of technology is met with avoidance, it can cause the senior citizen frustration due to an

inability to understand new ways of checking out at the grocery store, picking up medication, or

using the telephone (Vodanovich, 2014). Digital immigrants may also experience fear of the

unknown and fear of mistakes (Vodanovich, 2014). Mistakes and technology can be costly,

although computers are only capable of what the user is telling it to do as the computer cannot

think or make decisions on its own (Gibson, 2016). Digital immigrants are able to calm those

fears through removing anxiety which is created by the challenge being high and the skillset

being too low (Downing, 2014).

Intrigue

Those who do not use technology regularly may still be intrigued by what computers are

capable of accomplishing (Elliott, 2013). This intrigue is what can also help reduce anxiety as

people are likely to ask questions and seek help (Downing, 2014). As the digital immigrant asks

questions and gains new skills toward the computer the challenge of using the device is reduced

which results in less anxiety for the user (Kinash et al., 2013). The natural curiosity technology

promotes causes the user to start applying newly learned skill to other areas of the computer as a

form of trial and error (Blackmon et al., 2015). For the adult learner, trial and error is an

effective method as long as burn out does not occur (Loeng, 2010). In fact, trial and error is

included as a method of andragogy because the adult is able to apply what is learned, gain

experience and then try again (Lee et al., 2009). Reducing the fear in senior citizens is the first

step toward gaining technology skills and capitalizing on natural intrigue. Increased skills are

what will assist in reducing fears (Heaggans, 2012).

Customized Devices

Senior citizens who identify as digital immigrants have found that technology is

beginning gain value in various areas of life specifically in the role played as customers.

Technology created for an elderly market is an emerging industry (Eierdam, 2018). Devices that

assist in mobility as well as prompting digital immigrants for medication reminders, health and

fitness prompts, and other daily task reminders help senior citizens remain independent longer

(Lee, 2018). Technology is taking the aging process, which is known by some as a "growing

health epidemic," and capitalizing on the need to advance technology specifically to assist in the

needs of the senior community is causing technology to improve the quality of life amongst

seniors at a rapid pace (Lee, 2018). Additionally, healthcare itself is advancing as a result

(Quaintance, 2018).

<center>**Depression Among Senior Citizens**</center>

Depression knows no boundaries when it comes to age. People of all ages may

experience seasons of depression (Liu, Gou, & Zuo, 2014). Among senior citizens, depression

can mask itself in many different ways such as chronic pain, fatigue, mobility issues, and

medication abuse (Jaremka, Fagundes, & Glaser, 2013). These symptoms are common within

the elderly population due to other ailments and therefore often are assigned to conditions other than depression (Jaremka et al., 2013; Liu et al., 2014).

Senior citizens are plagued though with changes in lifestyle and wellness which are both associated with depression (Liu et al., 2014). When someone in the elderly community begins to talk about body aches or trouble getting out of bed, many family members and even those in the medical community are quick to dismiss the symptoms as a normal part of the aging process (Jaremka et al., 2013; Yamazaki, Nakano, Saito, & Yasumura, 2012). Depression in the elderly can look different than in other age groups, but can be just as severe (Jaremka et al., 2013). Risk factors across all age groups including those in the 70 years of age and older category look the same (Jaremka et al., 2013). Those at greatest risk are females with a lower level of education and cognitive decline (Western, 2013).

Causes of Elderly Depression

There are many reasons that an elderly person would begin suffering from depression. The loss of a partner is a primary reported cause for depression in a widowed individual (Liu et al., 2014, p. 754-5). Losing a loved one is not the only loss that impacts the senior community; loss of mobility, hearing, eye sight, the ability to drive, and cognitive thinking are all stated causes of depression among the elderly (Liu et al., 2014). Throughout the aging process, it is important that mental health is assessed as a routine check-up within retired individuals (Yamazaki et al., 2012). Simply leaving a career behind is enough for some individual's mental health state to decline (Barcelos-Ferreira, Nakano, & Steffens, 2013). As people devote large periods of life to a career it becomes such an integrated part of the daily routine that upon retirement, the individual suffers a loss of routine which can result in the grieving process and

depression (Barcelos-Ferreira et al., 2013). As senior citizens age, any big change can dramatically spark a perceived loss resulting in depression.

The loss of responsibility when one retires may feel good at first; however, as years go by, the elderly may no longer feel in control of daily life ("impact of stress and depression upon work and well-being," 2014).   On average, depressive symptoms occur three years after retirement in men and five years in women ("impact of stress", 2014). As the individual settles into retirement, daily contact with the world diminishes (Liu et al., 2014). The social network has become disconnected due in large part to proximity (Liu et al., 2014). For the senior citizen, this lack of socialization may result in feeling a lack of relevancy in the world (Jaremka et al., 2013. This feeling is an associated predictor the elderly person is in the early stages of depression (Liu et al., 2014). The lack of socialization within the senior community upon retirement can be similarly illustrated when compared to parents who become empty nesters. As children leave the home for college or career, many parents are at a loss ("Cross-sectional investigation on the risk factors of empty nesters' cognitive dysfunction in Sichuan province," 2015). Daily routine is broken and social interaction is no longer as high as it was when children were living at home ("Cross-sectional investigation, 2015). The stress of this change often correlates with divorce in those married more than 15 years ("Cross-sectional investigation, 2015).

Marriage Upon Retirement

Marriage can be equally hard when a spouse retires as new routines are established. If one spouse is still working, loneliness can take on different forms of depression as well as anxiety (Iveniuk, Waite, Laumann, McClintock, & Tiedt, 2014; Migerode, 2012). The spouse who is still working may become lonely feeling no one else is contributing to the household or

may resent missing out on being home with the spouse (Jensen & Rauer, 2015). Conversely, the spouse who is now retired may feel isolated from the rest of the world and no longer feel valued due to not contributing to the household in the same ways as before (Jensen & Rauer, 2015). As the two spouses find the new roles in a retired household, there can be conflict which leaves the couple wondering if the marriage can survive (Jensen & Rauer, 2015). As life as the couple knew it changes, the appearance can manifest itself as a sense of crumbling and lead to depression (Iveniuk et al., 2014).

Couples are able to combat many of these issues that lead to mental health decline by increasing levels of communication regarding emotional stability and concerns immediately (Migerode, 2012). Simply being aware of the individual and spousal concerns can reduce feelings of depression (Liu et al., 2014). Finding peers who are at the same place in life and may handle the situation differently also helps reduce depression (Liu et al., 2014). Part of the difficulty for the elderly however is finding peers who relate and are willing and able to socialize (Jaremka et al., 2015). When both spouses are retired, finding another couple is often the key to increasing the feeling of relevancy and value within each individual's life (Olivetti & Rotz, 2016). Having both spouses retired decreases the levels of both resentment and depression among the couple (Jaremka, 2013; Migerode, 2012). Increasing social discourse between the spouses allows for new routines to be formed (Migerode, 2012).

Within Retirement Communities

Although retirement communities are known for having a large population of those 50 years of age and older kept busy with community meal time, outings, and activities; depression still runs rampant among senior citizens living in retirement communities (Holland, Boukouvalas, Wallis, Clarkesmith, Cooke, Liddell, & Kay, 2016). Social acceptance is not

guaranteed and may feel both invasive and isolating at the same time (Holland et al., 2016). As a new member moves into the community there is typically an abundance of curiosity with each new resident (Holland et al., 2016). This can overwhelm someone who has been home alone for years and as a result can increase levels of anxiety which cause the senior to isolate further (Phillips, 2014). Over stimulation followed by withdrawal is a factor for anxiety and depression within retirement communities, particularly for those new to the community or with a change in health status (Holland et al, 2016; Rosenberg et al., 2015). As someone suffers an ailment such as a stroke or joint replacement which changes mobility even if it is for the short term, the community can place added pressure on the individual by having to relieve the procedure or occurrence frequently at the request of peers' concern (Phillips, 2014).

Activities designed by the community to keep seniors active range from playing BINGO to ice cream socials, small trips to the grocery store and larger trips to weekend destinations. These activities give opportunities but are not required (Holland et al., 2016; Rosenburg et al., 2015). Remaining active is an important stabilizer for mood and well-being among senior citizens, still many residents do not participate in the community sponsored activities (Phillips, 2014). Residents remain in apartments for large portions of the week and may only come out for medical care or meals (Rosenberg et al., 2015).

Many resident care facilities offer on-site doctor visits, physical therapy, banking, hair salons, voting precincts, and restaurants (Holland, 2016). These amenities are often considered by families and senior citizens due to the level of convenience but also are alarming by making it possible to not leave a building for months or in extreme cases years (Holland, 2016; Rosenberg et al., 2015). When a family views a loved one as being well taken care of, calls and visits might decrease with the assumption the parent, grandparent, or friend is doing well (Phillips, 2014).

The reality is that many seniors feel abandoned within a community and are living life simply by going through the day-to-day motions required for survival (Rosenberg et al., 2015). Eventually, some give up ("The impact", 2014).

Suicide Among the Elderly

With high levels of depression, it is not surprising that senior citizens experience a greater rate of suicide than most other populations (Wu, Varnik, Tooding, Varnik, & Kasearu, 2013). A recent study found that 59% of those 50 and older in rural Chinese communities commit suicide (Wu et al., 2013). The primary cause of suicide among seniors is depression (Conwell, Van Orden, & Caine, 2011). In rural communities the senior citizen faces unique challenges such as the inability to care for oneself and the resources to be cared for may not exist (Shah & Zarate-Escudero, 2016). Financial matters are another major concern for seniors as the elderly struggle to put food on the table while also taking proper care of medical needs (Dien, 2016). As friends and family pass away or move on, the elderly may feel personal value is reduced and commit suicide (Conwell et al., 2011; Dien, 2016). The pain of isolation and the feeling of becoming a burden is often too much for the person to handle without help from others (Shah & Zarate-Escudero, 2016). Without appropriate mental and behavior healthcare, the individual faces a long and destructive road (Conwell et al., 2011). Many seniors find the answer in the own medicine cabinet (Dien, 2016).

Unlike younger suicide victims who prefer methods of using a gun or hanging; senior citizen suicide often goes unrecorded as the senior overmedicates and the death is ruled an accidental overdose (Dien, 2016). Due to deteriorating health, medication is easy to access. Conditions such as chronic pain, trouble breathing, heart problems, high blood pressure, and diabetes are all common conditions within the elderly (Shah & Zarate-Escudero, 2016). These

confirmed illnesses provide the senior citizen with the necessary medication to quietly end life (Dien, 2016). Simply taking an overdose of blood pressure medication allows the senior to go to sleep and without any pain and never wake up again (Shah & Zarate-Escudero, 2016). Often, just taking a second or third dose is enough to stop a weak heart (Shah & Zarate-Escudero, 2016). If the senior appears to have no other ailment, the death will be recorded as natural causes (Shah & Zarate-Escudero, 2016). In cases where the family or doctors become aware of the overdose, the overdose is often referred to as accidental and responsibility is placed on other factors such as forgetfulness (Dien, 2016).

Senior citizens are often desperate to escape a life that no longer offers the quality and stability they once had ("The impact", 2014). Depression does not always have to be a silent killer, with appropriate care, depression can be overcome (Rosenberg et al., 2015; Western, 2013). Sometimes medication may assist the deep seeded thoughts and feelings an elderly person endures (Jaremka, 2013). Other times, changes in lifestyle and habits are enough to weather even the darkest of seasons for the elderly (Liu et al., 2014). Mental health within the senior community has stigmas that must first be overcome (Phillips, 2014). In order to do so, society and medical practitioners must begin discussing the problems without shame and allow senior citizens to express these feelings without being told they are simply another symptom of aging (Shah & Zarate-Escudero, 2016).

Loneliness and Technology

Realization

As senior citizens age it is expected that eventually spouses will die and loved ones as well. Additionally, the senior might face downsizing the home, moving into retirement communities, and sometimes leaving the communities where the senior has lived for decades

(Bernard & Scharf, 2007). In 2015, nearly 30 percent of those 50 and older lived alone (Crewdson, 2016). The impact that these life events play in the individual's life is difficult to measure particularly when 43 percent of seniors report feeling lonely (Nicolaisen & Thorsen, 2012). The problem is that it is hard to identify when these common life events play a larger role in the overall well-being of the individual (Raut, 2016). The senior citizen begins to feel isolated with each passing life event and the more life events occur, the more confirmation the senior receives of the loneliness (Raut, 2016). Although there are many seniors who suffer from loneliness, people often still feel the situation is a unique situation and believe it is either a part of life, or an ill fate that is deserved (Nicolaisen & Thorsen, 2012). Despite efforts to coordinate visits with family, many seniors report only seeing a few visitors per month (Nicolaisen & Thorsen, 2012). Many healthcare providers believe the answer is through increased levels of socialization (Crewdson, 2016).

Technology is often seen as a source to reconnect for the digital immigrant and provide a level of socialization previously seen in youth when a strong peer group existed (Huber & Watson, 2014). Connecting through social media to long lost friends, seeing grandkids for the first time using a visual phone call, or being able to find a hobby online, senior citizens and digital immigrants are able to socialize after many hours spent of feeling alone (Burmeister, 2012). This desire to regain social contacts pushes the curiosity of the digital native further to the point of connecting through the computer (Huber & Watson, 2014).

Establishing New Interests

Technology also allows for the lonely senior to gain new interests or reconnect with past interests (Larrson, 2013). Today, senior citizens are increasing their presence on the computer and not just through social media but also through smart devices (Lee & Groves, 2014). From

connected homes to smart phones, senior citizens are able to speak, rather than type for example. As one ages the dexterity in the hands can diminish over time and the ability to use the voice rather than hands provides an opportunity to send a text message or refill a prescription (Cunha, Adao, & Trigueiros, 2014). Adaptive use technology grants access to those with low vision or auditory issues (Noell-Waggoner, 2015). Programs now provide telephones free of charge that also use closed captioning in real time to assist seniors on what someone is saying and also provides a transcript to family members, doctors, and others who are concerned about the senior citizens well-being (Cunha et al., 2014). Technology today goes beyond the workplace and brings a multitude of modern conveniences into the home and personal lives of most Americans (Larrson, 2013). Senior citizens who are trying to combat loneliness utilizing technology must also be careful (Paiva & Abreu, 2012).

Scams

As senior citizens connect to technology as a means to escape loneliness, seniors may also be connecting to a dangerous and often predatory environment (Appelt, 2016). Scams that target the elderly often prey not only on loneliness but also on lack of understanding (Appelt, 2016; Mears, Reisig, Scaggs, & Holtfreter, 2014). From unexpected phone calls and text messages to emails claiming someone must reset a bank account, information senior citizens receive online is often assumed to be truthful rather than a scam (Reisig & Holtfreter, 2013). Seniors are often unable to recognize when something is suspicious on the computer due to inexperience and a lack of awareness (Appelt, 2016).

Scams specifically target senior citizens assuming the senior does not know any better than to respond (Mears et al., 2014). Something as simple as alerting the senior that a bill is past due will generally receive an immediate response (Appelt, 2016; Mears et al., 2014). Once the

payment information has been submitted, the scammer then drains the bank account of the victim within minutes (Appelt 2016). By the time the victim becomes aware there is a problem, accounts, passwords, and personal identifiable information has already been compromised (Mears et al., 2014).

Scams involving seniors know no boundaries (Reisig & Holtfreter, 2013). Senior citizens are able to be preyed upon by many different organizations including book clubs that charge monthly and even organizations representing themselves as ministry which take in sometimes weekly dollars for prayer that are not associated with any church or proof of legitimacy (Hans, Boyle, James, Yu, & Bennet, 2015). When the senior reports these situations to the local attorney general's office, the senior is often told the scammer was from outside of the United States and that the best outcome is that the bank refunds the money as fraud (Hans et al., 2015). Sadly, for the senior citizen, credit reports could face irreparable damages that may impact the future ability to qualify for special programs and housing (Hans et al., 2015).

Family Assumptions

Technology connects the senior in many ways to the outside world including family (Paiva & Abreu, 2012). Family members are able to communicate via text message and phone calls to loved ones or track the senior via a GPS system for those who may live alone or in a retirement community (Paiva & Abreu, 2012). The family member often feels that because the family member speaks with a loved one regularly that this replaces the need to visit as often (Nicolaisen & Thorsen, 2012). The senior citizen still requires face-to-face visits and communication in order to prevent loneliness (Liu et al., 2014). Technology may assist seniors with connecting to in person relationships of all kinds including romantic relationships as dating applications and websites cater to an older crowd (Appelt, 2016).

Family members may be shocked to learn their elderly grandparent or parent has met someone online but as technology levels increase among seniors, so too do the number of relationships being formed over the internet (Appelt, 2016). Facebook reports that the fastest growing clientele are females over the age of 50 (Friemel, 2016). Senior citizens are reconnecting with old classmates, former churches, and long lost family members as a result of the connectedness technology provides (Friemel, 2016). Technology in many cases is able to combat some of the loneliness senior citizens are facing in a modern society (Chan et al., 2016).

Technology and Well-Being

The senior community is plagued with loneliness and higher levels of depression and anxiety than other age groups (Jaremka et al., 2013; Liu et al., 2014; Nicolaisen & Thorsen, 2012). Senior citizens face various problems when it comes to mobility during the aging process which can cause feelings of isolation (Nicolaisen & Thorsen, 2012). The struggles facing seniors may present themselves as difficulty walking or losing their ability to drive (Raut, 2016). When a senior can no longer access a daily routine, the senior may begin to lose relationships and social interactions (Nicolaisen & Thorsen, 2012). Technology can be the greatest hindrance toward the senior citizens ability to embrace the trends of today, however, it can also be what helps them close the generational gap felt with children and grandchildren (Smith, 2014). The quality of life changes when technology is introduced to a senior citizen and it is not always positive (Chan et al., 2016). In the beginning, senior citizens may feel overwhelmed and discouraged by technology (Gibson, 2016). The inability to use it can cause the senior to feel inept or too old (Chan et al., 2016). This can certainly cause psychological damage as well as issues with self-esteem and depression (Chan et al., 2016).

Technology Helps

Technology may be the answer for senior citizens when it comes to reducing the feelings of depression (Smith, 2016). As senior citizens achieve goals of understanding and using technology better the seniors are then able to experience points of achievement which builds the self-esteem (Downing, 2014). As the elderly gain technology skills, senior citizens are able to connect with family and friends in the same way family and friends are connected and therefore no longer feel left out of the communication (Burmeister, 2012). For those who do not have the physical ability to leave home for groceries, pharmacy needs, or to go to the bank; understanding technology offers a way to remain independent for a longer period of time (Levine et al., 2016).

Technology Weakness

Once the senior citizen embraces technology and is able to complete the functions necessary to daily living, technology is likely to change (Couper, 2013). One of the greatest weaknesses to technology for the senior citizens is how quickly it changes and advances (Stoerger, 2009). Advancing technology is primarily viewed in society as a good thing, but for the senior citizen may cause additional stress and anxiety (Smith, 2016). Senior citizens may struggle keeping up with technology simply for the pace in which it changes (Kinash et al., 2013). The digital immigrant may feel constantly confused when really technology is just changing incrementally (Kinash et al., 2013).

Lifelong Learning and Well-Being

There is a connection between learning and general well-being for individuals of all ages (Bostrom, Lee, & Kee, 2015). In special education it is common for therapy dogs to be brought into the school to establish connection between the students' well-being and hindrances in learning (Serpell, 2006). When a young student receives a therapy dog, the student is often able

to concentrate better in class (MacDonald & Barret, 2015). Additionally, taking care of an animal could improve self-confidence and over levels of happiness (Serpell, 2006). In the elderly, attachment with animals as pets provides the same type of companion care and improves the senior citizens overall well-being (MacDonald & Barret, 2015). When roadblocks are taken away, learning becomes possible regardless of the age of the student (Field, 2011). When the mind is able to accomplish and understand new tasks the individual becomes more self-assured and confident in future tasks (Downing, 2014). For the senior citizen this means even the smallest achievement becomes a big victory and the seniors are then able to push toward accomplishing additional victories (Bostrom et al., 2015).

Technology a Bridge to Happiness

The elderly experience a lot of challenges during the aging process and this reduces levels of self-confidence (Field, 2011). What was once a common task becomes a common challenge for the senior citizen; learning something new can actually repair the dissatisfaction the senior is facing as a result of the lack of ability and replace this thought with satisfaction at the mastery of something new (Field, 2011). Technology is perhaps the perfect topic for senior citizens to master because it is unfamiliar with even the basics of the computer or smart phone resulting in many small accomplishments being able to be achieved with high levels of frequency (Bostrom et al., 2015).

Understanding how to use a touch screen is an example that can be life changing for a senior citizen (Bostrom et al., 2015). Once the basics of a touch screen are understood the senior citizen can begin to think of all the places in life touch screens can be found and then determine how it may improve overall well-being (Levine et al., 2016). For example, touch screens today are found at the self-checkout line at the grocery store, to sign a package from UPS, and to order

food at many restaurants (Levine et al., 2016). As technology continues to evolve, the senior citizen is able to stay relevant simply by continuing to learn (Bostrom et al., 2015).

As the elderly are able to move past physical health and focus on mental health and well-being, seniors are able to find greater levels of happiness (Holland et al., 2016. Happiness is a component of well-being and the more independent a senior citizen feels, the greater the chance of increasing happiness levels as well (Holland et al., 2016). As senior citizens are able to persist through the daily challenges by use of motivation; tackling technology skills becomes more of a pleasure and way to socialize (Brink, 2001). When someone feels experiences are current and relevant to the world today, the senior citizens are more confident in conversation and therefore improve overall happiness levels while also reducing levels of loneliness (Burmeister, 2012). Together, these components are utilizing intergenerational learning experiences combined with technology to improve the well-being of the senior citizen (Cheryl, 2008; Crewdson, 2016).

Conclusion

Senior citizens may not even be aware how much lives are being impacted by technology (Couper, 2013). Today technology is everywhere and it is likely to only increase in accessibility and demand (Chan et al., 2016). Senior citizens general well-being should be measured to determine if technology is contributing in any way to the general well-being (Friemel, 2016; Gonzalez et al., 2015; Huber & Watson, 2014). As the problems senior citizens face today surface, the ability to discuss otherwise taboo subjects such as depression, loneliness, and relevance in a society that has long past seniors by from a technology perspective can be overwhelming and isolating (Crewdson, 2016). Treating the physical ailments of the elderly is no longer enough in a society which understands the importance mental health plays in the overall well-being of the individual (Barcelos-Ferreria et al., 2013).

The more aware senior citizens become of the issues facing well-being the better the elderly can combat the issues through conventional and unconventional methods (Conwell et al., 2011). Technology plays an important role in connecting multiple generations (Kinash et al., 2013). As senior citizens are able to gain knowledge from younger generations, the group is able to utilize that information to connect with a larger community (Sandlin et al., 2011; Smith, 2014). In addition, more youthful generations are able to understand what the aging process looks like up close and combat some of the issues not only for self in the future, but for the near future of the current aging population (Van Manen, 2015). Connecting all generations through technology is one strategy among many that are helping senior citizens become lifelong learners and adapt to an ever changing world (Vodanovich, 2014). Technology does not solve all of the well-being issues associated with the elderly, but it should be determined if there is a connection to the seniors understanding of technology and the ability to overcome some of the unique challenges associated with well-being such as depression, loneliness, and isolation which too often plague the daily lives of those 50 years of age and older (Crewdson, 2016; Liu et al., 2014; Vodanovich, 2014).

CHAPTER THREE: METHODS

Overview

The purpose of this quantitative correlational study was to determine if there was a relationship between well-being and technology among senior citizens in Indiana. This chapter explains the setup of the research conducted to determine if there was a correlation by utilizing the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form as well as the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). The chapter explains thoroughly the setting and process in which research has been conducted beginning with the design of the study. This chapter then discusses the research design, research questions, null hypotheses, instrumentation, procedures, and data analysis.

Design

A correlational research design was used to examine the relationship between the number of technology courses senior citizens take and well-being. The predictor variable for this research was the number of technology courses senior citizens have taken. This was measured using a self-report. The criterion variable used was self-reported well-being. Well-being is defined as the state of happiness, resilience, and overall wellness of an individual (Boydell, 2015). The bivariate correlation was used to measure the strength and direction of the relationship of the two variables listed above (Gall, Gall, & Borg, 2007; Warner, 2013).

Research Questions

The research questions for this study were:

RQ1: Is there a relationship between the number of technology based courses senior citizens have completed and their well-being levels as measured by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form?

RQ2: Is there a relationship between the number of technology based courses senior citizens have completed and their well-being levels as measured by the Warwick-Edinburgh Mental Well-being Scale?

Null Hypotheses

The null hypotheses for this study were:

H_0**1:** There is no statistically significant correlation between the number of technology based courses senior citizens have completed and well-being levels as measured by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form.

H_0**2:** There is no statistically significant correlation between the number of technology based courses senior citizens have completed and well-being levels as measured by the Warwick-Edinburgh Mental Well-being Scale.

Participants and Setting

Participants of the study were a convenience sample of students utilizing computer labs and classes through an organization that teaches technology courses. The organization was located in Indiana and focused on helping senior citizens better understand technology. The organization provides services to the public at 37 locations throughout the state. The organization utilizes private classroom space with technology provided. Each classroom held 6-8 students and the Windows 10 computer as well as an Apple iPad were provided so that all students were learning on the same equipment. Each course being taught by the organization

lasted six weeks and met a total of one hour per week. The courses were designed to teach those 50 years and older basic technology skills. The sample was chosen due to the regional proximity of the researcher, past involvement within the organization, and the willingness of the organization to assist with proper delivery of surveys and results.

Participants were 50 years of age and older, had completed a technology course through a third party provider, and resided in the state of Indiana. The courses lasted six weeks and the surveys were collected at the end of each course. A convenience sample of 200 participants were administered a paper survey through the organization. Incomplete surveys were removed leaving a sample size of 104 participants. The sample size was large enough to determine if any correlation exists and a minimum of 100 respondents was achieved as expected. The sample ended up being more than enough required based on a medium effect size for a statistical power of .7 at the .05 alpha level (Gall et al., 2007). Demographic questions were combined with both survey tools into one paper survey. The following information was collected: age, gender, if the person was living in a retirement community, and how many hours the person spends on the computer each day. See Appendix F for demographic questionnaire. The sample consisted of 11 males and 93 females. The average age of the participants was in the 60-69 years old range. Sixty-six respondents were currently living in a retirement community and 38 were not. Of the participants three spent less than three hours on a computer per week and 101 spent more than three hours on a computer per week.

Instrumentation

This research study utilized two instruments. The first instrument is known as the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form and the second the Warwick-Edinburgh Mental Well-being Scale (WEMWBS).

Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form

The purpose of this instrument was to measure psychiatric issues for research purposes in both adults and children (Stevanovic, 2011). Specifically, the instrument measures a person's degree of enjoyment and satisfaction in life in regards to various areas of daily functioning. A five-point Likert Scale was used on the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF). The short form i\was recommended for adults and the longer form for children. The Likert Scale for this instrument follows: 1= Very Poor, 2= Poor, 3= Fair, 4= Good, 5= Very Good. The instrument has 16 total questions with an expected completion time of five minutes. The final two items in the survey are not scored. The items are scored using pencil and paper. The raw scores for the questionnaire range from 14-70 with a low score of 14 and a high score of 70. The sum of the total score was added to determine the score and divided by 100 to extract a percent. The reliability of this instrument has been tested and produces a Cronbach's Alpha coefficient of .86 (Mick, Faraone, Spencer, Zhang, & Biederman, 2008). This instrument has been used specifically in an adult population previously (Mick et al., 2008). The test retest median is .93 and the internal consistency is .90 (Stevanovic, 2011). Permission for the QLESQ-SF was approved (see Appendix E and Appendix D for the QLESQ-SF).

Warwick-Edinburgh Mental Well-being Scale

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was developed to monitor mental well-being in the general population. The scale has a Cronbach's Alpha coefficient of .89 which assures reliability of the instrument (Stewart-Brown, 2012). Previously, researchers had used the tool to measure research in psychology and medicine. The instrument

was used in Stewart-Brown (2012) to measure performance of different cultural and

geographical populations. The instrument was developed by experts representing various fields

and positions in psychology, public health, social science, and health promotion (Stewart-Brown,

2012). The experts defined well-being and came up with an appropriate way to measure overall

well-being using the survey. The survey takes approximately five minutes to complete and

consists of 14 items. The score was figured utilizing pencil and paper. Scores ranged from 14-70

with 14 being the low score and 70 being the high score. All questions on the survey were

worded with a positive tone. A Likert Scale was used on a five-point scale as follows: 1= None

of the time, 2= Rarely, 3= Some of the time, 4= Often, 5= All of the time (Stewart-Brown,

2012). Permission to use the WEMWBS can be found in Appendix C. The WEMWBS can be

found in Appendix B.

Procedures

The first step in the process to begin this study was to gain Institutional Research Board

(IRB) approval. The Institutional Research Board had a responsibility to ensure the study was

legally in compliance and that the institution approved of the study giving the researcher

permission to complete the study. The researcher did not begin researching until the IRB had

given permission. See Appendix A for IRB approval.

Next, due to the sensitivity of the population for this research, a pilot study was

completed and evaluated. This step was necessary to ensure the senior citizen population was

understanding and responding according to the directions and that no further directions were

needed. Results were evaluated based on if the seniors were successful in completing the pilot

survey. A pilot was completed and the survey proceeded.

Third, the survey was reviewed to determine if minor edits on demographic questioning

and directions to complete the survey were needed. These edits would have been made based on recommendations gleaned from conducting and evaluating the pilot study. However, no edits were needed or made. The senior citizens received a full explanation as to why the survey was important and were read the directions aloud. See appendix F for directions.

Once the survey had been finalized, the instructors administered the paper survey at the end of the six-week course. The instructor also needed to know how to return the survey by placing the completed surveys in a sealed envelope and writing the date in which the surveys were administered on the outside of the envelope. The researcher then picked up the completed surveys and returned them to the researcher.

The survey and instructors were now prepared for the research to begin. The organization elicited participants on behalf of the researcher. The organization passed out a copy to every senior citizen student completing a six-week course during the research period. Senior citizen students were given an explanation of the research and informed of the ability to participate in the research. The participants were instructed to place the completed survey in the envelope while in a room with the instructor.

After each six-week course completion, the researcher then gathered the results. The results were submitted to the Ivy Tech Community College Mooresville Office for both storage and to run the data through SPSS. The researcher received the output of the data while the research office maintains storage and integrity of the data.

Once the SPSS document had been retrieved by the researcher, the results were then evaluated. Evaluating the results carefully followed the understanding of the bivariate correlation data as well as the scoring methods of the survey evaluation tools. Lastly, the results were then analyzed and reported.

Data Analysis

Initial data were collected utilizing a paper survey and entered into SPSS. Demographic information was extracted and reviewed. The demographic information along with the SPSS outputs were analyzed and reviewed using descriptive statistics. First, the data was scanned for data entry errors and inconsistencies. Incomplete survey results were removed leaving a sample size of 104 participants. Then, the assumptions for a correlational Pearson product moments test were examined. The assumption tests included Assumption of Bivariate Outliers which used scatterplots to look for extreme outliers.

The second assumption test was to be for Linearity and implemented the use a scatterplot between the predictor and criterion variables. Lastly, the Assumption of Bivariate Normal Distribution were tested using a scatterplot to look for the classic "Cigar Shape" between the variables (Warner, 2013). The nulls were going to be tested at the 95% confidence level using the Pearson *r* and the effect size was to be measured. The direction of the line was to be determined after utilization of a scatterplot (Warner, 2013).   As assumptions did not meet the linearity and normality standards utilizing Pearson's *r* correlations, a Spearman's *rho* correlation had to be utilized. A scatterplot matrix was then used to determine the monotonic relationship (Warner, 2013). Lastly, a 95% confidence interval with an alpha of .05 was utilized to determine if the null hypotheses were rejected or failed to reject using the Spearman's *rho* correlation (Warner, 2013).

CHAPTER FOUR: FINDINGS

Overview

The purpose of this correlational study was to determine if a relationship exists between the number of technology classes taken and general well-being among senior citizens in Indiana. To evaluate the potential relationship, senior citizens enrolled in technology courses within the state of Indiana completed a written survey containing the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF), the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), questions about course enrollment, and demographic questions. The survey was handed out to 200 students enrolled in technology courses with the partner organization during the fall of 2017. The results throughout this chapter were analyzed using SPSS and explained using figures, tables, and scatterplots along with descriptive statistics. This chapter discusses the research questions, null hypotheses, and descriptive statistics.

Research Questions

RQ1: Is there a relationship between the number of technology based courses senior citizens have completed and their well-being levels as measured by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form?

RQ2: Is there a relationship between the number of technology based courses senior citizens have completed and their well-being levels as measured by the Warwick-Edinburgh Mental Well-being Scale?

Null Hypotheses

H₀1: There is no statistically significant correlation between the number of technology based courses senior citizens have completed and well-being levels as measured by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form.

H₀2: There is no statistically significant correlation between the number of technology based courses senior citizens have completed and well-being levels as measured by the Warwick-Edinburgh Mental Well-being Scale.

Descriptive Statistics

Demographics

A convenience sample was used for this research study where 200 surveys and consent forms were distributed resulting in 104 total participants ($N=104$). Of the respondents who completed the entire survey, 89.4% were female ($n=93$) and 10.6% were male ($n=11$). Retirees made up 63.5% ($n=66$) of the sample size while 36.5% ($n=38$) identified as still working or not yet retired. Only 2.9% ($n=3$) of the participants spent one hour or less per day on the computer, while 97.1% ($n=101$) spent more than three hours per day using the computer.

The current study evaluated the number of technology classes each participant had completed within the program where the survey was completed. The results showed 27.9% ($n=29$) of the population had only completed one course and 29.8% ($n=31$) of the population had taken six or more courses. The rest of the population, 42.3% ($n=44$) had completed between two and five classes at the time of this study. See Table 1 Number of Classes Completed

.

Table 1

Number of Classes Completed

Number of Classes	*n*	*% of N*	Cumulative Percent
1	29	27.9%	27.9%
2	20	19.2%	47.1%
3	10	9.6%	56.7%
4	11	10.6%	67.3%
5	3	2.9%	70.2%
6+	31	29.8%	100%
Total	104	100%	100%

The ages of the participants ranged from 50-89+ years. The 60-69 years of age category made up the largest age group with 38.5% (*n*=40) of the total sample size identifying with that age group. A total of 26.9% (*n*=28) of the sample were 50-59 years old, 24.0% (*n*=25) were 70-79 years old, and 10.6% (*n*=11) were 80-89 years old. The majority of the participants (89.4%, *n*=93) were between 50-79 years old. See Table 2 for Age of Participants.

Table 2

Age of Participants

Age Group	*n*	*% of N*	Cumulative Percent
50-59	28	26.9%	26.9%
60-69	40	38.5%	65.4%
70-79	25	24.0%	89.4%
80-89	11	10.6%	100%
Total	104	100%	100%

Participants were asked which technological devices were owned with the choices of desktop (D), laptop (L), tablet (T), and smartphone (S). The highest frequency of ownership between those choices came in at 31.7% ($n=33$) in the laptop and smartphone combination while 100% of the sample ($n=104$) owned a smartphone. Table 3 shows the breakdown of how many participants owned each group of technological devices. Only 3.8% ($n=4$) of the participants in the survey did not own a desktop, laptop, or smartphone.

Table 3

Devices Owned

Devices	n	% of N
DLS	13	12.5%
DLTS	15	14.4%
DS	9	8.7%
DTS	4	3.8%
LS	33	31.7%
LTS	21	20.2%
S	4	3.8%
TS	5	4.8%
Total	104	100%

The participants surveyed used technological devices for a variety of activities online. Participants were given choices to determine what they used the internet for and the following selections were possible: text (T), email (E), Facebook (F), dating (D), banking (B), shopping (S), medical (M), news (N), and video calls (V). Only 5.8% ($n=6$) of the total sample size did not

use text messaging while 4.8% (*n*=5) did not have a Facebook account. The demographic information showed that the sample was already using devices for various purposes prior to taking the survey.

Data Collection Variables

Participant well-being was the dependent variable in the study and was measured utilizing two different instruments, the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) and the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF). Both instruments were analyzed along with the demographics to determine if a relationship exists between the number of technology classes taken and the participants' well-being.

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) takes approximately five minutes to complete and consists of 14 positively worded items scored on a five-point Likert scale. The five-point scale consisted of the following responses: 1= None of the time, 2= Rarely, 3= Some of the time, 4= Often, 5= All of the time (Stewart-Brown, 2012). Scores for the WEMWBS ranged from 14-70 with 14 being the lowest score possible and 70 being the highest score. A copy of the WEMWBS can be found in Appendix B.

The mean total for the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was 56.47 with a median score of 60.50 and a mode of 65.00. The standard deviation for the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was 10.21 with a range of scores from 24.00 to 65.00. Table 3 shows the descriptive statistics for the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). Figure 1 displays the histogram for the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) variable.

Table 4

Descriptive Statistics

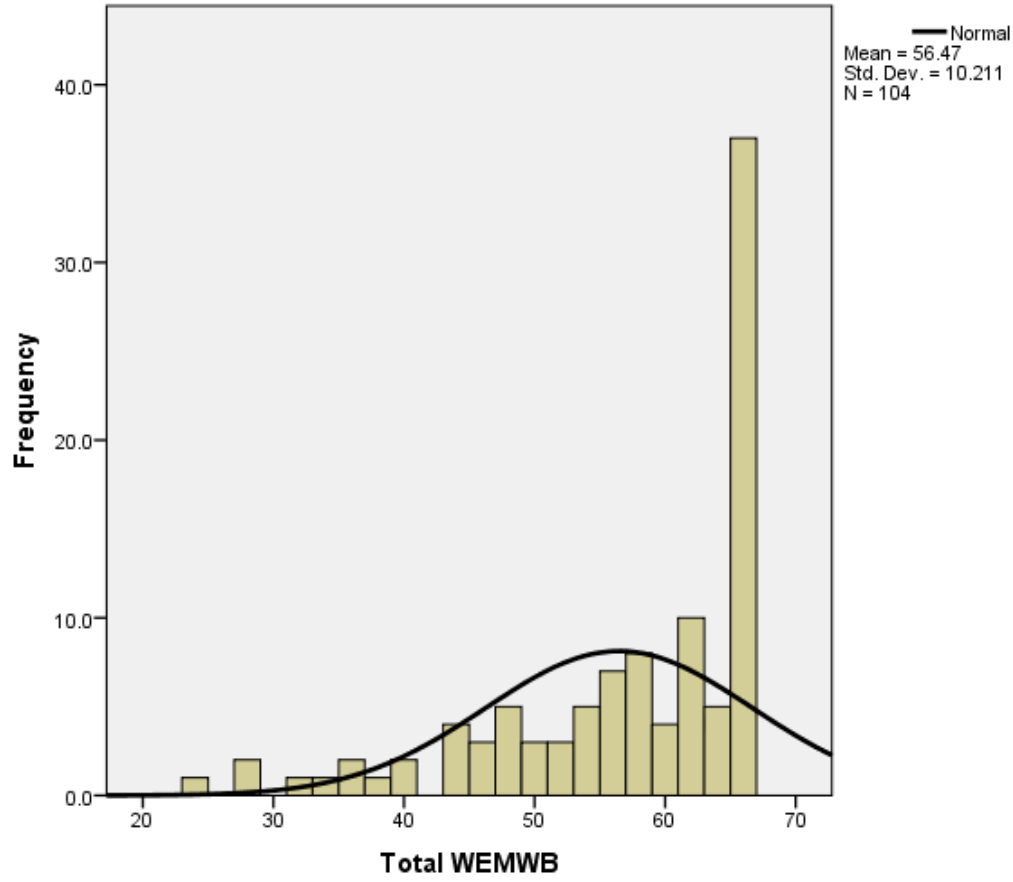| Statistic	*WEMWBS*	*QLESQ-SF*	*Number of Courses*
Mean	56.47	67.89	3.31
Median	60.50	73.00	3.00
Mode	65.00	78.00	6.00
Standard Deviation	10.21	12.86	2.04
Range	24.00 to 65.00	26.00 to 80.00	1.00 to 6.00

Figure 1. Histogram of Warwick-Edinburgh Mental Well-being Scale.

The Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF) took approximately five minutes to complete and consists of 16 items. The last two questions in the survey are not scored; however, the first 14 items are scored on a five-point Likert scale consisting of the following responses: 1= Very Poor, 2= Poor, 3= Fair, 4= Good, 5= Very Good. Scores for the QLESQ-SF range from 14-70 with 14 being the lowest score possible and 70 being the highest score. Total score was added together for items 1-14 to determine the score and divided by 100 to obtain a percentage. A copy of the QLESQ-SF can be found in Appendix D.

The mean total for the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF) was 67.89 with a median score of 73.00 and a mode of 78.00. The standard deviation for the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF) was 12.86 with a range of scores from 26.00 to 80.00. Table 3 shows the descriptive statistics for the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF). Figure 2 displays the histogram for the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF) variable.
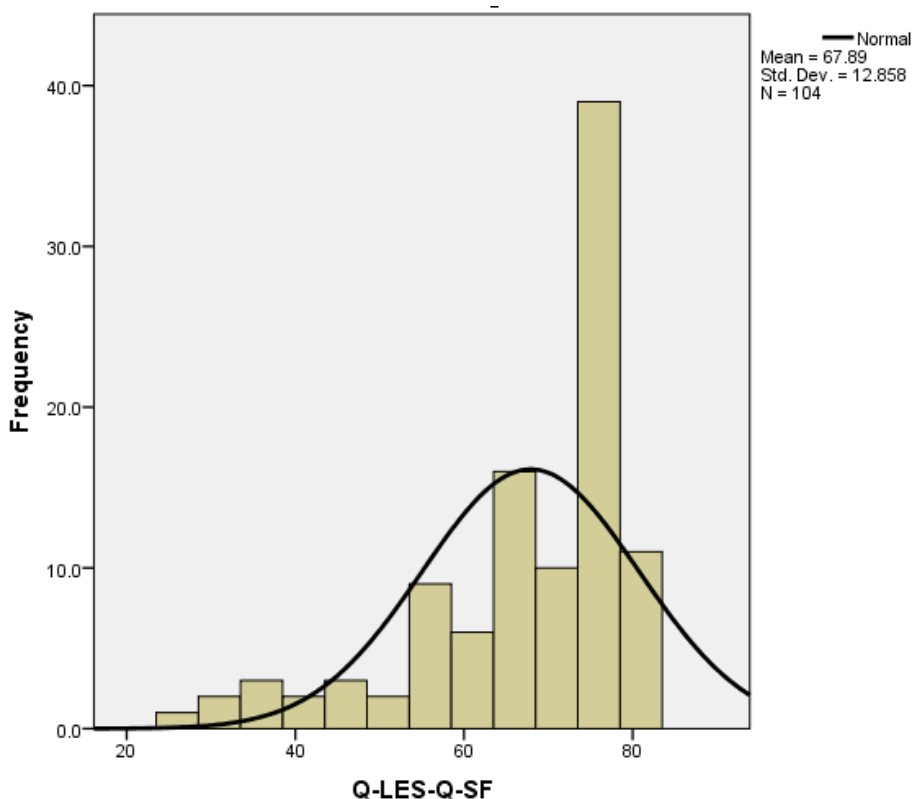
Figure 2. Histogram of Quality of Life and Enjoyment and Satisfaction Questionnaire- Short

Form.

The predictor variable evaluated in the study was the number of technology courses

completed by study participants. The mean total for technology courses completed was 3.31

with a median score of 3.00 a mode of 6.00. The standard deviation for technology courses

completed was 2.04 with a range of courses completed from 1.00 to 6.00. Table 3 shows the

descriptive statistics for the technology courses completed. Figure 3 displays the histogram for

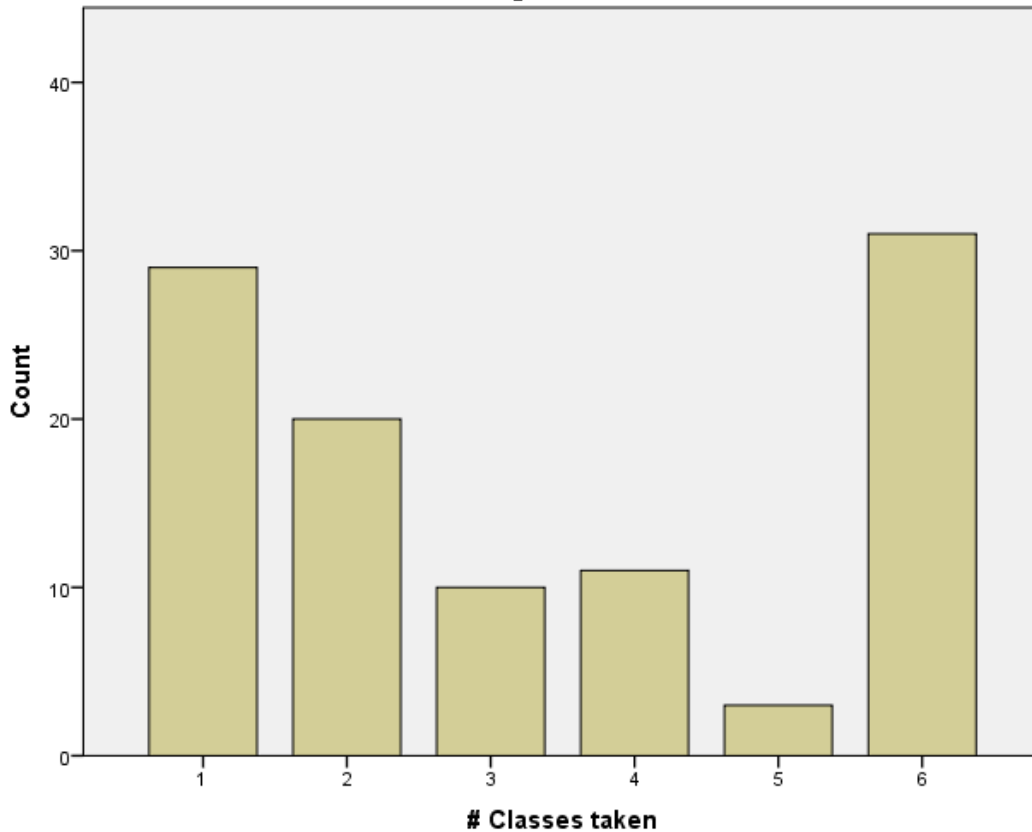the variable of technology courses completed.

Figure 3. Histogram of Number of Technology Courses Completed.

Results

Prior to entering data into SPSS, all surveys containing incomplete data were removed to decrease the probability of Type I and Type II errors (Warner, 2013). Assumption testing was completed to evaluate the bivariate outliers, bivariate normal distribution, and linearity of the dataset. The completion of assumption testing involved creating and evaluating scatterplots and looking for the classic "Cigar Shape" which was not present in this study.

Assumption Testing for Normality and Linearity

In order to complete a Pearson's *r* correlation, four assumptions tests were conducted. The first assumption found that all three variables were not continuous as the number of courses was ranked (Field, 2013). To assess the linearity of the data, scatterplots were evaluated.

Although the scatterplot matrix in Figure 4 shows a linear relationship between the two assessments utilized, a linear relationship does not exist between either the WEMWBS or the QLESQ-SF and the number of technology courses completed. There were no outliers found in the Assumptions of Bivariate Outliers upon visual inspection of the scatterplot in Figure 4.
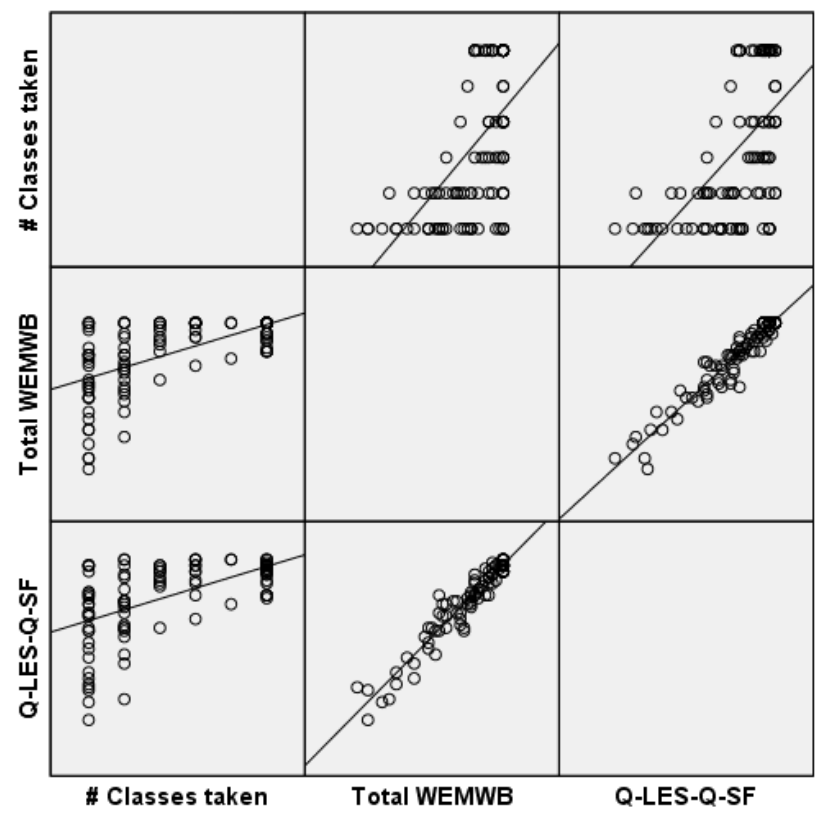

Figure 4. Scatterplot Matrix of WEMWBS, QLESQ-SF, and Number of Courses Completed.

Upon visual inspection of the scatter plots and evaluation of the bivariate normal distribution and linearity of the data, the combined variables of number of technology courses completed, with either Warwick-Edinburgh Mental Well-being Scale (WEMWBS) or the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF) did not pass the normality assumption testing for Pearson's *r*. Because non-parametric tests such as Spearman's *rho* do not require the data to meet the same assumption testing requirements and the results of Spearman's *rho* have been found to be equivalent to the results of Pearson's *r,* the researcher decided Spearman's *rho* was the appropriate correlation to complete due to the data violating the assumptions of normality and linearity (Warner, 2013). Assumptions were met because the variables were ordinal level or higher and a monotonic relationship was found. See Figure 4. No bivariate outliers were found and outliers have less of an impact on the data in non-parametrical data analysis since scores are converted to ranks, which occurs with a Spearman's *rho* analysis (Warner, 2013).

Null Hypothesis One

H_01: There is no statistically significant correlation between the number of technology based courses senior citizens have completed and well-being levels as measured by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form.

The Spearman's *rho* correlation was utilized for data analysis due to the bivariate normal distribution and linearity being violated. The data analysis compared the criterion variable measured by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form to the predictor variable of number of technology based courses senior citizens have completed. Senior citizens (*N*=104) in a program offering technology based courses within the state of Indiana participated in the study. The results in the scatterplot matrix in Figure 4 showed a

positive relationship between the number of technology courses completed and overall score on

the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form. There was a

statistically significant moderate-to-strong positive correlation $rs(102) = .59, p < .05$ between the

number of technology course completed and overall score on the Quality of Life and Enjoyment

and Satisfaction Questionnaire- Short Form. Null hypothesis one was rejected.

Null Hypothesis Two

H_02: There is no statistically significant correlation between the number of technology

based courses senior citizens have completed and well-being levels as measured by the Warwick-

Edinburgh Mental Well-being Scale.

Due to the assumptions of normality and linearity being violated, a Spearman's *rho*

correlation was utilized for data analysis. Senior citizens (N=104) in a program offering

technology based courses within the state of Indiana participated in the study. The data analysis

compared the criterion variable or the Warwick-Edinburgh Mental Well-being Scale to the

predictor variable or number of technology based courses senior citizens have completed. The

results in the scatterplot matrix in Figure 4 showed a positive relationship between the number of

technology courses completed and overall score on the Warwick-Edinburgh Mental Well-being

Scale. There was a statistically significant moderate-to-strong positive correlation $rs(102) = .63,$

$p < .05$ between the number of technology course completed and overall score on the Warwick-

Edinburgh Mental Well-being Scale. Null hypothesis two was rejected.

CHAPTER FIVE: CONCLUSIONS

Overview

As technology continues to make its way into the daily lives of all age groups, senior citizens are tasked with learning to keep up with technology. This research study examined what happens to seniors who take technology classes in terms of general well-being. The research supported that technology plays an important role not only in the lives of senior citizens but the impact understanding and use has on well-being. This chapter discusses how the conducted research adds to the current body of research as well as critically looks at the limitations of the research study itself. Lastly, this chapter makes recommendations for continued research in the field as it relates to outcomes and gaps discovered through this research.

Discussion

The purpose of this correlational study was to determine if there was a relationship between the number of technology courses senior citizens complete and their well-being. Senior citizens in Indiana were surveyed while taking technology courses that helped the seniors better understand how to use the computer, tablet, smartphone, or the internet. Once the course was completed, the seniors were given a survey which included two instruments, the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short form and the Warwick-Edinburgh Mental Well-being Scale, along with demographic questions designed by the researcher. This information was utilized to compare and determine if a relationship exists between the number of technology courses taken and well-being as measured by the two instruments.

The first research question asked, "Is there a relationship between the number of technology based courses senior citizens have completed and their well-being levels as measured

by the Quality of Life and Enjoyment and Satisfaction Questionnaire- Short Form (QLESQ-SF)?"

The results showed that as the number of technology courses increased, the level of well-being as measured by the QLESQ-SF also increased. The null hypothesis was rejected and therefore established that there was a significant correlation between the number of technology courses taken and the well-being of the senior-citizen. As the elderly participant gained knowledge and experience utilizing technology, the participants began to report higher levels of well-being.

Adults more readily look at learning something new as a negative task which may also explain why those who have taken just one technology class showed a more negative attitude as measured by mood when answering the survey questions while those who had taken three or more classes began to show a more positive attitude (Holmes & Abington-Cooper, 2000). Once the material was no longer new, participants were simply advancing the skillset and attitude began to improve. What is unique is that the outlook was measured overall, not just in terms of technology use. Learning a new activity promoted a healthier outlook and understanding technology better improved the overall sense of well-being.

One aspect that played a role in the continued growth of well-being throughout the number of technology classes completed is that the courses were specific to the goals of the participant. Demographic questions identified the many uses the senior citizen had for the internet as well as the devices utilized. Without a connection to the goal in which someone is trying to learn, the adult will not value the material enough to absorb and retain the information (Van Manen, 2015). It was necessary that the participant utilized goal setting in each class in order to make the material more valuable which led to greater retention as the courses

progressed. The overall ability to function in daily life improved as reported by the QLESQ-SF

as well. Adults may find it challenging to find the right resources needed in order to master the

skillset needed to utilize the technology that would help improve life and general well-being

(Huber and Watson, 2014). Adults who completed these courses designed for senior citizens

found the ability to improve general well-being and specifically the ability to improve daily life

functions.

Overall, participants reported having a higher level of life satisfaction within the past

week after having taken multiple technology courses. This may have a lot to do with the fact

that in nearly every subject, a computer is likely a required piece of equipment (Gibson, 2016).

As technology fully integrates itself into the lives of senior citizens, understanding how to use

technology better will directly improve life satisfaction levels as participants are able to

understand more about what is happening via the use of technology.

The second research questions asked, "Is there a relationship between the number of

technology based courses senior citizens have completed and their well-being levels as measured

by the Warwick-Edinburgh Mental Well-being Scale (WEMWBS)?

This results helped show that people who were taking the computer classes showed an

interest in learning something new; however, the more classes completed resulted in an increased

interest in learning something new. The null hypothesis was rejected and therefore established

that there was a significant correlation between courses senior citizens have completed and their

well-being levels.   Gaining self-confidence is important for students of all ages and senior

citizens are no exception (Downing, 2014). As the participants continued studies, participants

also became more interested in other people. This too is not surprising as senior citizens who

contribute to society are more likely to accept help in return and the effort becomes give and

take. When the senior citizen gains new skills, there is an increased likelihood to reach out to others and offer help too (Lee et al., 2009).   In programs where the senior citizens were partnered with a younger student to peer tutor, the seniors became more receptive when the younger student began trying to help the senior citizen as well (Chen et al., 2015). These seniors not only felt more interested in others but the additional knowledge also made the senior citizen feel more useful.

Overall the WEMWBS results showed that the general well-being of the senior citizen participant increased along with the number of technology courses completed. This measurement may impact overall retirement by ensuring the quality of life is optimized through the use and understanding of technology. The well-being of the elderly will greatly impact the affordability of aging over the next 15-20 years mostly due to the rising costs of healthcare and affordability of housing (Pang, 2011).   With the increase in population of the elderly, senior citizens must also increase the ability to stay active and engaged, technology is one way of improving activity and engagement (Sixsmith, 2016). The research conducted for this study showed senior citizens felt more confident and optimistic about the future with a greater knowledge of how to better use technology.

Optimism will only get the person so far however, as the aging population increases, the concerns of obesity, heart disease, and mental illnesses also increase (Tiernanet al., 2013). Mental health is something many seniors are challenged with as loneliness, depression, and anxiety are major factors in the overall health of the elderly. More seniors are staying active through retirement but overall health has created a demand for new forms of technology to help manage the aging population (Birkett, 2015; Theirnan et al., 2013). Participants in this research study concluded that energy levels have increased by learning a new activity as well. Perhaps

technology gives the senior citizen something to do when the senior would otherwise be idle where loneliness and depression most likely occur.

Implications

The implications of this study created a purpose to expand the resources and means available to senior citizens and the use and understanding of technology. Senior citizens who do not use or understand how to use technology rely on others to assist, sometimes with basic daily tasks (González et al., 2015). As technology becomes more widely used for banking, shopping, and the medical industry, senior citizens must try to keep up with its use. Technology is always changing so just as the senior citizen gets used to completing a task, the task may slightly or more dramatically change with a simple software update or change to a website login (Brink, 2001; Friemel, 2016). Continued education and discussion specific to the senior citizen should be considered in order to promote and give opportunity for the elderly population to stay in tune with societal demands.

When a senior citizen is disconnected from society, levels of loneliness go up and well-being levels decline (Van Manen, 2015). This disconnection can occur in many different ways. Senior citizen living environments often change during the aging process. Some may live in retirement communities by choice while others are forced into different living arrangements due to health, physical, or mental limitations (Holmes Abington-Cooper, 2000). As their living environment becomes more secluded, the senior citizens may find technology helps keep them connected (Van Manen, 2015).

Social media has been increasingly popular among the aging population (Gibson, 2016). For many, social media allows the elderly to connect with family and friends who no longer live close. As people live longer today than in prior generations, having great-grandparents is

increasingly the norm for younger generations. Being connected on platforms such as Twitter, Facebook, and Instagram allows multiple generations to connect around similar interests. The days of letter writing and telephone calls are long gone for the youngest of generations. If the elder generation wants to communicate with teenagers and younger children, the use of texting and social media are the primary way of connecting.

Technology in the lives of senior citizens can be very fearful (IJsselsteijn, 2012). Much of what people do not know and understand can cause fear. Helping senior citizens understand the value of knowing how to properly use technology may provide enough motivation to overcome the fear. Many senior citizens enjoy using technology once the fear has been removed (Loeng, 2010). Common fears are often subject specific. If a senior citizen has fear over the cost of the equipment, showing reasonable products such as a tablet that costs $30 may remove some of the fear of using the equipment. Many senior citizens may fear having identity or bank accounts stolen and may benefit from education on how to recognize when a website is secure and how to create a strong password (Van Manen, 2015). Much of the fear can be dispelled simply through conversation, education, and experience.

As the aging population is increasing dramatically, technology companies should be refining product development to specifically meet the needs of digital immigrants. Technology has taken the medical industry into new and exciting areas that were previously unknown or unrealized (Gibson, 2016). If the same effort was put into senior citizens' daily tasks, many could prolong living alone. As virtual assistants and smart home technology continues to expand and become more user friendly, senior citizens with mobility issues can benefit from having technology turn on or off a light, or lock and unlock a door by a simply voice command or by utilizing an application on a tablet or smart phone.

Memory issues are also plaguing the aging population and technology enhancements specific to memory could greatly impact the well-being of those with memory conditions (Pang, 2011). Having reminders to turn off a stove, lock the front door, turn on the light in the bathroom, and verbally send a text to a family member could literally end up saving the life of a senior who may get confused, disoriented, or suffer from a fall. Technology could very well determine how gracefully people age in the future and how long people are able to function independently at home.

Technology companies have an interest in providing the latest technology and advancements but are largely leaving behind a generation that could improve quality of life most dramatically with adaptive use technology. Should mainstream technology choose to invest and market in technology designed specifically for the aging population, companies could gain credibility as well as market share in a population currently being underserved by the industry. As technology becomes customized to the needs of senior citizens, the industry would also need to provide resources on how to use the technology in the senior community. This could justify additional industry experts in technology who are able to simplify instructions of use to make information more digestible to the senior citizens.

Limitations

Limitations for this research study included the convenience sample and the results it had on having a mostly female population. Men generally do not live as long as women which may have impacted the number of men participating in the survey. Gathering a larger and more evenly distributed gender population limited the ability of the researcher to evaluate demographic trends based on sex. The research was also limited to participants in the state of Indiana. Opening the research to the broader national population would provide more concrete

evidence of how technology is impacting the senior citizen community. Additionally, because technology is ever changing and the population continuously aging, the research presented here offers a snapshot. Due to the rate of change in both categories, the research results may also change dramatically. Broadening the sample size and location would potentially eliminate the limitations discussed in this section.

Recommendations for Future Research

Further research into the impact technology has on the senior citizen should be conducted. Research looking into the following categories could further the knowledge of how technology is impacting the senior citizen:

1. Well-being is a component of happiness. Further research should be conducted to determine if the understanding of technology increases other components of wellness as well as happiness in general among senior citizens.

2. It is suggested that a larger sample size of males be collected to determine if gender plays a role in the relationship between technological understanding and well-being.

3. Research should be conducted to determine if living in a retirement home, living with family, or living alone are evenly impacted by the use of technology.

4. Additional research should be conducted to determine if there is a relationship between loneliness and the use of technology.

5. Research measuring previous education levels in addition to comparing well-being with level of understanding of technology could broaden the understanding of the elderly's ability to learn new tasks.

6. Adaptive technology could be researched to determine if the elderly perform better with equipment designed for specific needs.

Looking into these additional suggestions would help further the body of knowledge surrounding the many ways technology could be impacting senior citizens. As technology and the aging population continue to increase, it is necessary to focus on the different aspects of technology in influencing the daily lives of all users but specifically the lives of those who grew up without similar technology. Digital immigrants face unique challenges and these questions will help determine possible and constructive solutions.

References

Appelt, L. (2016). Designing for the elderly user: internet safety training. *University of Baltimore*, 193. doi:10111270

Baecker, R., Sellen, K., Crosskey, S., Boscart, V., & Barbosa Neves, B. (2014). Technology to reduce social isolation and loneliness. In *Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility* (pp. 27-34). ACM.

Baltzell, A. L. (2013). Sport coach happiness and well-being: A consideration of Seligman's full life and PERMA model of well-being. *PsycEXTRA Dataset*. doi:10.1037/e574802013-353

Bandyopadhyay, S., Dey, P., Bardhan, A., Banerjee, S., & Das, S. (2015). OwlishOracle: architecting a social media-based e-learning platform for primary education of underprivileged children by senior citizens of India. *International Journal of Social Media and Interactive Learning Environments*, *3*(4), 322-339.

Barcelos-Ferreira, R., Nakano, E. Y., & Steffens, D. C., (2013) Quality of life and physical activity associated to lower prevalence of depression in community-dwelling elderly subjects from Sao Paulo. *Journal of Affective Disorders, 150*: 616–622.

Bayne, S., & Ross, J. (2007). The 'digital native'and 'digital immigrant': a dangerous opposition. In *annual Conference of the Society for Research into Higher Education (SRHE)* (Vol. 20).

Bernard, M., & Scharf, T. (2007). *Critical perspectives on ageing societies*. Bristol: The Policy Press.

Birkett, B. (2012). Overcoming Seniors' Technology Fears | Senior Care Corner. *Senior*

Care Corner. Retrieved from http://seniorcarecorner.com/overcoming-seniors-technology-fears

Birkett, K. (2015). Technology advances in medical care benefiting seniors & caregivers. Retrieved from http://seniorcarecorner.com/technology-medical-care-seniors-caregivers

Blackmon, J., Boles, A. N., & Reddy, P. H. (2015). Garrison Institute on Aging—Lubbock Retired and Senior Volunteer Program (RSVP) provides services to South Plains, Texas. *Frontiers in Aging Neuroscience*, *7*.

Boström, A., Lee, S. J., & Kee, Y. (2015). Community well-being through intergenerational cooperation. *Learning and Community Approaches for Promoting Well-Being*, 57-68. doi:10.1007/978-3-319-12439-1_4

Boydell, T. (2015). Facilitation of adult development. *Adult Learning*, *27*(1), 7-15. doi:10.1177/1045159515615111

Brink, S. (2001). Digital divide or digital dividend? Ensuring benefits to seniors from information technology. *Seniors and Technology*.

Brookfield, S. D. (2005). *The power of critical theory for adult learning and teaching*. Berkshire, England: Open University Press.

Burmeister, O. K. (2012). What seniors value about online community. *The Journal of Community Informatics*, *8*(1).

Chan, M. Y., Haber, S., Drew, L. M., & Park, D. C. (2016). Training older adults to use tablet computers: does it enhance cognitive function?. *The Gerontologist*, *56*(3), 475-484.

Chen, A. M., Kiersma, M. E., Yehle, K. S., & Plake, K. S. (2015). Impact of the Geriatric Medication Game® on nursing students' empathy and attitudes toward older adults. *Nurse Education Today*, *35*(1), 38-43.

Cheryl, S. (2008). Lifelong learning: Becoming computer savvy at a later age. *Educational Gerontology*, 1055-1069.

Christian, B. J., Camps, S., Chester, L., Lillehagen, P., Quick, S., & Walsh, C. (2012). Engaging with community: How schools are helping their students become informed, responsible and compassionate citizens. *TEACH Journal of Christian Education*, *5*(2), 12.

Conwell, Y., Van Orden, K., & Caine, E. D. (2011) Suicide in older adults. *Psychiatric Clinics of North America, 3*, 451–468.

Couper, M. P. (2013). Is the sky falling? New technology, changing media, and the future of surveys. In *Survey Research Methods* (Vol. 7, No. 3, pp. 145-156).

Coyners, J. (1996). Building bridges between generations. *Educational Leadership*, *53*, 14-16.

Crewdson, J. (2016). The effect of loneliness in the elderly population. *Healthy Aging & Clinical Care in the Elderly*, 1. doi:10.4137/hacce.s35890

Cross-sectional investigation on the risk factors of empty nesters' cognitive dysfunction in Sichuan province. (2015). *The Gerontologist*, *55*, 487-487. doi:10.1093/geront/gnv206.06

Csibra, G., & Gergely, G. (2011). Natural pedagogy as evolutionary adaptation. *Philosophical* Transactions of the Royal Society of London B: Biological Sciences, 366(1567), 1149-1157.

Cunha, A., Adão, T., & Trigueiros, P. (2014). HelpmePills: a mobile pill recognition tool for elderly persons. *Procedia Technology*, *16*, 1523-1537. doi:10.1016/j.protcy.2014.10.174

Damerell, P., Howe, C., & Milner-Gulland, E. J. (2013). Child-orientated environmental education influences adult knowledge and household behaviour. *Environmental Research Letters*, *8*(1), 015016.

Dein, S. (2016). Rational suicide in the elderly: Anthropological perspectives. *Rational Suicide in the Elderly*, 75-82. doi:10.1007/978-3-319-32672-6_6

Dunnett, C. (1998). Senior citizens tackling technology. *Educational Media International*, *35*, 9-12.

Eierdam, V. (2018, February 20). Senior citizens embrace social media. Retrieved March 01, 2018, from http://www.thereflector.com/life/article_c763153c-168d-11e8-bbf0-1f0cb5fd22b2.html

El-Attar, M. (2005). Older adults and internet health information seeking. *Human Factors and Ergonomics Society*.

Elliott, D. (2013). Deconstructing digital natives: Young people, technology and the new literacies. *ELT Journal*, *67*(4), 510-512.

Emanuel, J. (2013). Digital native librarians, technology skills, and their relationship with technology. *Information Technology and Libraries (Online)*,*32*(3), 20.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Thousand Oaks, CA: SAGE Publications.

Field, J. (2011). Lifelong learning, welfare and mental well-being into older age: Trends and policies in Europe. *Active Ageing, Active Learning*, 11-20. doi:10.1007/978-94-007-2111-1_2

Findsen, B. (2007). Freirean philosophy and pedagogy in the adult education context: The case of older adults' learning. *Studies in Philosophy and Education*, *26*(6), 545-559.

Friemel, T. N. (2016). The digital divide has grown old: Determinants of a digital divide among seniors. *new media & society*, *18*(2), 313-331.

Gibson, K. (2016). Teaching adults: hidden but Somewhat obvious elements to consider.

González, A., Ramírez, M. P., & Viadel, V. (2015). ICT learning by older adults and their

    attitudes toward computer use. *Current Gerontology and Geriatrics Research*, *2015*, 1-7.

    doi:10.1155/2015/849308

Gouthro, P. A. (2010). Well-being and happiness: Critical, practical and philosophical

    considerations for policies and practices in lifelong learning. *International Journal of*

    Lifelong Education, *29*(4), 461-474. doi:10.1080/02601370.2010.488813

Han, S. D., Boyle, P. A., James, B. D., Yu, L., & Bennett, D. A. (2015). Mild cognitive

    impairment and susceptibility to scams in old age. *Journal of Alzheimer's Disease*, *49*(3),

    845-851. doi:10.3233/jad-150442

Highlights from older Americans 2016: Key indicators of well-being. (2016). *The*

    Gerontologist, *56*, 582-582. doi:10.1093/geront/gnw162.2342

Hodgson, A., & Kambouri, M. (1999). Adults as lifelong learners: The role of pedagogy in the

    new policy context. *Understanding pedagogy and its impact on learning*, 175-194.

Holland, C., Boukouvalas, A., Wallis, S., Clarkesmith, D., Cooke, R., Liddell, L., & Kay, A.

    (2016). Transition from community dwelling to retirement village in older adults:

    cognitive functioning and psychological health outcomes. *Ageing and Society*, 1-28.

    doi:10.1017/s0144686x16000477

Hollins, E. R. (2006). Transforming practice in urban schools. *Educational*

    Leadership, 63(6), 48-52. Retrieved from EBSCOhost Database.

Holmes, G., & Abington-Cooper, M. (2000). Pedagogy vs. andragogy: A false dichotomy?.

Huber, L., & Watson, C. (2014). Technology: Education and training needs of older

    adults. *Educational Gerontology*, *40*(1), 16-25.

Huber, M. M. (2010). PERMA in education: Enhancing the academic well-being of students.

    PsycEXTRA Dataset. doi:10.1037/e537902012-305

IJsselsteijn, W. A. (2012). Digital games and the seniors of tomorrow. *Gerontechnology*, *11*(2),

    387.

Iveniuk, J., Waite, L. J., Laumann, E., McClintock, M. K., & Tiedt, A. D. (2014). Marital

    conflict in older couples: Positivity, personality, and health. *Journal of Marriage and*

    Family, *76*(1), 130-144. doi:10.1111/jomf.12085

Jensen, J. F., & Rauer, A. J. (2015). Marriage work in older couples: Disclosure of marital

    problems to spouses and friends over time. *Journal of Family Psychology*, *29*(5), 732-

    743. doi:10.1037/fam0000099

Jaremka L. M., Fagundes, C. P., & Glaser, R. (2013) Loneliness predicts pain, depression, and
fatigue:

    Understanding the role of immune dysregulation. *Psychoneuroendocrinology, 38*, 1310–

    1317.

Kinash, S., Wood, K., & Knight, D. (2013). Digital immigrant teachers and digital native

    students: What happens to teaching?.

Knowles, M. S. (1970). *The modern practice of adult education: Andragogy versus pedagogy*.

    New York: Association Press.

Koh, L. C. (2012). Student attitudes and educational support in caring for older people–a review

    of literature. *Nurse Education in Practice*, *12*(1), 16-20.

Kolodinsky, J. (2002). Bridging the generation gap across the digital divide: Teens teaching

    internet skills to senior citizens. *Journal of Extension*, *40*.

Larsson, E. (2013). Internet based activities (IBAs): Seniors' experiences of the conditions

required for the performance of and the influence of these conditions on their own participation in society. *Educational Gerontology*, 155-167.

Lee, B., & Groves, D. (2014). Seniors: Technology, leisure, and travel. *International Journal of Humanities and Social Science*, *4*(14), 1-21. Retrieved from http://www.ijhssnet.com/

Lee, C. C., Czaja, S. J., & Sharit, J. (2009). Training older workers for technology-based employment. *Educational Gerontology*, *35*(1), 15–31. http://doi.org/10.1080/03601270802300091

Lee, S. (2018, February 05). Tech firms creating gadgets for senior citizens. Retrieved March 01, 2018, from http://www.dailydemocrat.com/general-news/20180205/tech-firms-creating-gadgets-for-senior-citizens

Lensch, J. (1997). A high-tech magnet for seniors. *Educational Leadership*, *54*, 64-66.

Levine, D. M., Lipsitz, S. R., & Linder, J. A. (2016). Trends in seniors' use of digital health technology in the United States, 2011-2014. *JAMA*, *316*(5), 538-540.

Liu, L., Gou, Z., & Zuo, J. (2014). Social support mediates loneliness and depression in elderly people. *Journal of Health Psychology*, *21*(5), 750-758. doi:10.1177/1359105314536941

Loeng, S. (2010). *Andragogy: A historical and professional review*.

Lundt, J. (2002). It computes when young adolescents teach senior citizens. *Middle School Journal*, *31*, 18-22.

Lynch, C. (2009). Working retirement: Age and value in the United States. *Anthropology News*, *50*(8), 22-23. doi:10.1111/j.1556-3502.2009.50822.x

MacDonald, J. M., & Barrett, D. (2015). Companion animals and well-being in palliative care nursing: a literature review. *Journal of Clinical Nursing*, *25*(3-4), 300-310. doi:10.1111/jocn.13022

Mahoney, D. (2011). An evidence-based adoption of technology model for remote monitoring of elders' daily activities. *Ageing International, 36*(1), 66-81.

Marilyn, T. (1996). Computer technology: How it impacts the lives of older adults. *Ageing International*, *23*, 85- 91.

Mears, D. P., Reisig, M. D., Scaggs, S., & Holtfreter, K. (2014). Efforts to reduce consumer fraud victimization among the elderly: The effect of information access on program awareness and contact. *Crime & Delinquency*, *62*(9), 1235-1259. doi:10.1177/0011128714555759

Migerode, L. (2012). The no conclusion intervention for couples in conflict. *Journal of Marital and Family Therapy*, *40*(3), 391-401. doi:10.1111/jmft.12004

Monk, S., Campbell, C., & Smala, S. (2013). Aligning pedagogy and technology: A case study using clickers in a first-year university education course. *International Journal of Pedagogies and Learning*, *8*(3), 229-241.

Mori, K, &Harada, E. T. (2010). Is learning a family matter?: Experimental study of the influence of social environment on learning by older adults in the use of mobile phones. *Japanese Psychological Research, 52*(3), 244-255.

Noell-Waggoner, E. (2017). Lighting and the elderly. *Handbook of Advanced Lighting Technology*, 847-863. doi:10.1007/978-3-319-00176-0_50

Nicolaisen, M., & Thorsen, K. (2012). Impairments, mastery, and loneliness. A prospective study of loneliness among older adults. *Norsk Epidemiologi*, *22*(2). doi:10.5324/nje.v22i2.1560

Olivetti, C., & Rotz, D. (2016). Changes in marriage and divorce as drivers of employment and retirement of older women. doi:10.3386/w22738

Ozuah, P. O. (2016). First, there was pedagogy and then came andragogy. *Einstein Journal of Biology and Medicine*, *21*(2), 83-87.

Paiva, S., & Abreu, C. (2012). Low cost GPS tracking for the elderly and alzheimer patients. *Procedia Technology*, *5*, 793-802. doi:10.1016/j.protcy.2012.09.088

Pang, G. (2011). Good strategies for wealth management and income production in retirement. *Retirement Income*, 163-177. doi:10.7551/mitpress/9780262016933.003.0007

Parker, J., Maor, D., & Herrington, J. (2013). Authentic online learning: Aligning learner needs, pedagogy and technology. *Issues in Educational Research*, *23*(2), 227-241.

Phillips, L. J. (2014). Retirement community residents' physical activity, depressive symptoms, and functional limitations. *Clinical Nursing Research*, *24*(1), 7-28. doi:10.1177/1054773813508133

Phuntsog, N. (1999). The magic of culturally responsive pedagogy: In search of the genie's lamp in multicultural education. *Teacher Education Quarterly, 26*(3), 97. Retrieved from http://search.proquest.com.ezproxy.liberty.edu:2048/docview/222858549?accountid=12085.

Quaintance, Z. (2018, March). The quest for digital equity. Retrieved March 01, 2018, from http://www.govtech.com/civic/The-Quest-for-Digital-Equity.html

Raut, B. (2016). Socio-demographic and health related correlates of loneliness in elderly. *Journal of Medical Science and Clinical Research*, *04*(11), 13834-13846. doi:10.18535/jmscr/v4i11.55

Reece, I., & Walker, S. (2016). *Teaching, training and learning: A practical guide*. Business Education Publishers Ltd.

Reisig, M. D., & Holtfreter, K. (2013). Shopping fraud victimization among the elderly. *Journal of Financial Crime*, *20*(3), 324-337. doi:10.1108/jfc-03-2013-0014

Reynolds, S., & Hitchcock, J. (2014). Faculty Attitudes toward teaching adults with learning disabilities. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, *3*(1), 35-48.

Rockman (2011). The effective practice incentive community (EPIC): The EPIC leadership development program evaluation report. Retrieved from http://files.eric.ed.gov/fulltext/ED533493.pdf

Rosenberg, D. E., Bellettiere, J., Gardiner, P. A., Villarreal, V. N., Crist, K., & Kerr, J. (2015). Independent associations between sedentary behaviors and mental, cognitive, physical, and functional health among older adults in retirement communities. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *71*(1), 78-83. doi:10.1093/gerona/glv103

Ross-Gordon, J. M., & Murray-Johnson, K. (2015). Faculty in adult degree programs as teachers of adults and as adult learners.

Sandlin, J. A., Wright, R. R., & Clark, C. (2011). Reexamining theories of adult learning and adult development through the lenses of public pedagogy. *Adult Education Quarterly*, 0741713611415836.

Seligman, M. E. (2011). *Flourish: A visionary new understanding of happiness and well-being*.

Serpell, J. A. (2006). Animal companions and human well-being. *Handbook on Animal-Assisted Therapy*, 3-19. doi:10.1016/b978-012369484-3/50003-7

Shah, A., & Zarate-Escudero, S. (2016). Elderly suicide and suicide prevention. *Mental Health and Illness Worldwide*, 1-36. doi:10.1007/978-981-10-0370-7_24-1

Sixsmith, A. (2013). Technology and the challenge of aging. *Technologies for Active Aging*, 7-
    25. doi:10.1007/978-1-4419-8348-0_2

Smith, A. (2014). Older adults and technology use: Adoption is increasing, but many seniors
    remain isolated from digital life. *Pew Research Center*.

Stevanovic, D. (2011). Quality of life enjoyment and satisfaction questionnaire - short form
    for quality of life assessments in clinical practice: a psychometric study. *Journal of
    Psychiatric and Mental Health Nursing*, *18*(8), 744-750. doi:10.1111/j.1365-
    2850.2011.01735.x

Stoerger, S. (2009). The digital melting pot: Bridging the digital native-immigrant divide. *First
    Monday*, *14*(7).

The impact of stress and depression upon work and well-being. (2014). *Depression Care across
    the Lifespan*, 56-73. doi:10.1002/9780470749739.ch4

Thompson, P. (2013). The digital natives as learners: Technology use patterns and approaches to
    learning. *Computers & Education*, *65*, 12-33.

Tiernan, C., Lysack, C., Neufeld, S., & Lichtenberg, P. A. (2013). Community engagement: An
    essential component of well-being in older African-American adults. *The International
    Journal of Aging and Human Development*, *77*(3), 233-257. doi:10.2190/ag.77.3.d

Van Der Kaay, C. D., & Young, W. H. (2012). Age-related differences in technology
    usage among community college faculty. *Community College Journal of Research &
    Practice, 36*(8), 570-579.

Van Manen, M. (2015). *Researching lived experience: Human science for an action sensitive
    pedagogy*. Left Coast Press.

Vodanovich, S. (2014). *Digital Native Well-being and Development in Ubiquitous*

Spaces (Doctoral dissertation, ResearchSpace@ Auckland).

Western, D. (2013). Depression in women. *SpringerBriefs in Social Work*, 33-44. doi:10.1007/978-1-4614-7532-3_5

Wong, Y. C., Chen, H., Lee, V. W., Fung, J. Y., & Law, C. K. (2014). Empowerment of senior citizens via the learning of information and communication technology. *Ageing International*, *39*(2), 144-162.

Wu, J., Värnik, A., Tooding, L., Värnik, P., & Kasearu, K. (2013). Suicide among older people in relation to their subjective and objective well-being in different European regions. *European Journal of Ageing*, *11*(2), 131-140. doi:10.1007/s10433-013-0297-1

Xie, B. (2003). Older adults, computers, and the internet: Future directions. *Gerontechnology*, *2*(4). doi:10.4017/gt.2003.02.04.002.00

Yamazaki, S., Nakano, K., Saito, E., & Yasumura, S. (2012). Prediction of functional disability by depressive state among community-dwelling elderly in Japan: A prospective cohort study. *Geriatrics & Gerontology International*, *12*(4), 680-687. doi:10.1111/j.1447-0594.2012.00841.x

Yoder, A. M., Larson, H., Washburn, F., Mills, S., Carter, D., Brausch, B., & Lee, J. (2013). Adaptation of the Cild− Parent Relationship Therapy Model for use with senior citizen volunteers in school settings: A pilot study. *International Journal of Play Therapy*, *22*(2), 75.

Yong, S. T., & Gates, P. (2014). Born dgital: Are they really digital natives?. *International Journal of e-Education, e-Business, e-Management and e-Learning*, *4*(2), 102.

APPENDIX A

Dear Treg Hopkins,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(2), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

> (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
> (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Please retain this letter for your records. Also, if you are conducting research as part of the requirements for a master's thesis or doctoral dissertation, this approval letter should be included as an appendix to your completed thesis or dissertation.

Your IRB-approved, stamped consent form is also attached. This form should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document should be made available without alteration.

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
The Graduate School

APPENDIX B

APPENDIX C

Submission (ID: 372537681) receipt for the submission of
/fac/med/research/platform/wemwbs/researchers/register

Thank you for completing this registration. You now have permission to use WEMWBS in the manner detailed in your submission.

Question: Name:
Answer:
Treg Hopkins

Question: Email address:
Answer:
treg@treghopkins.com

Question: Institution/Organisation
Answer:
Liberty University

Question: Name:
Answer:
Treg Hopkins

Question: Email address:
Answer:
treg@treghopkins.com
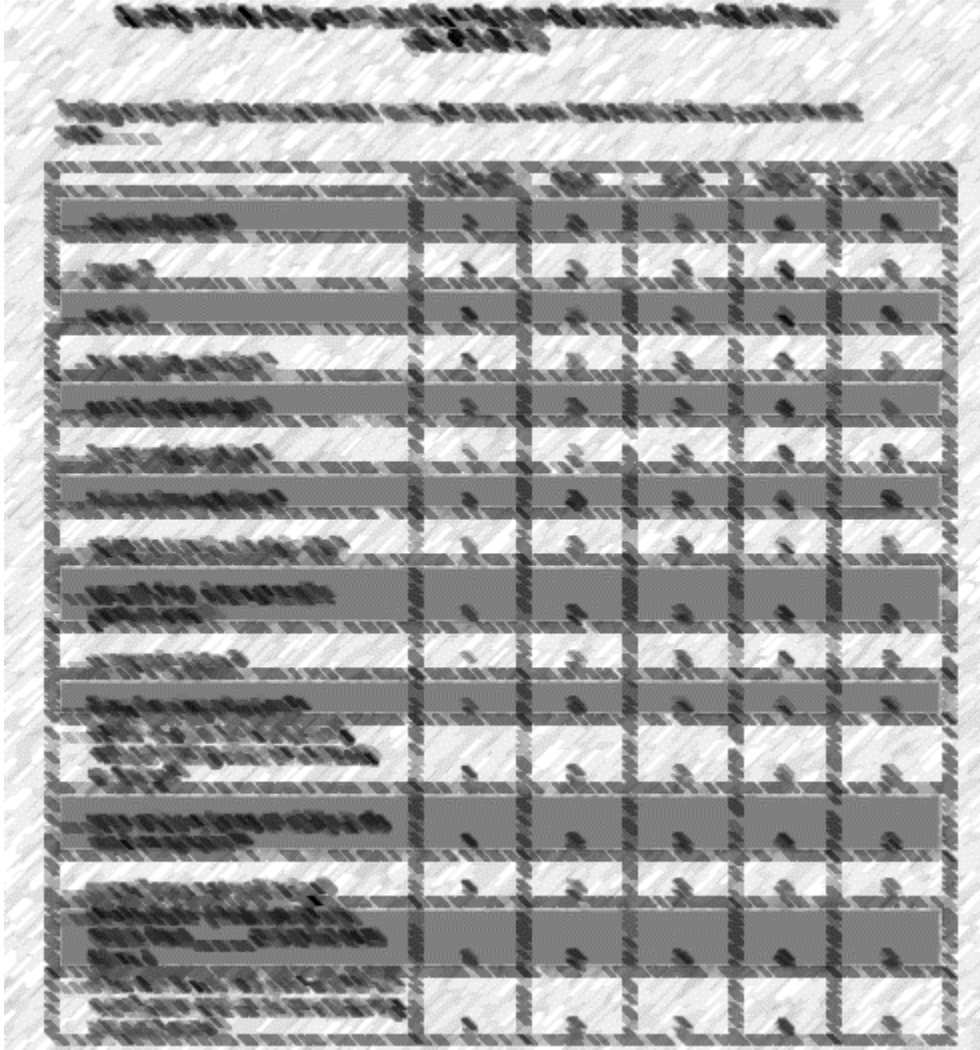
Question: Institution/Organisation
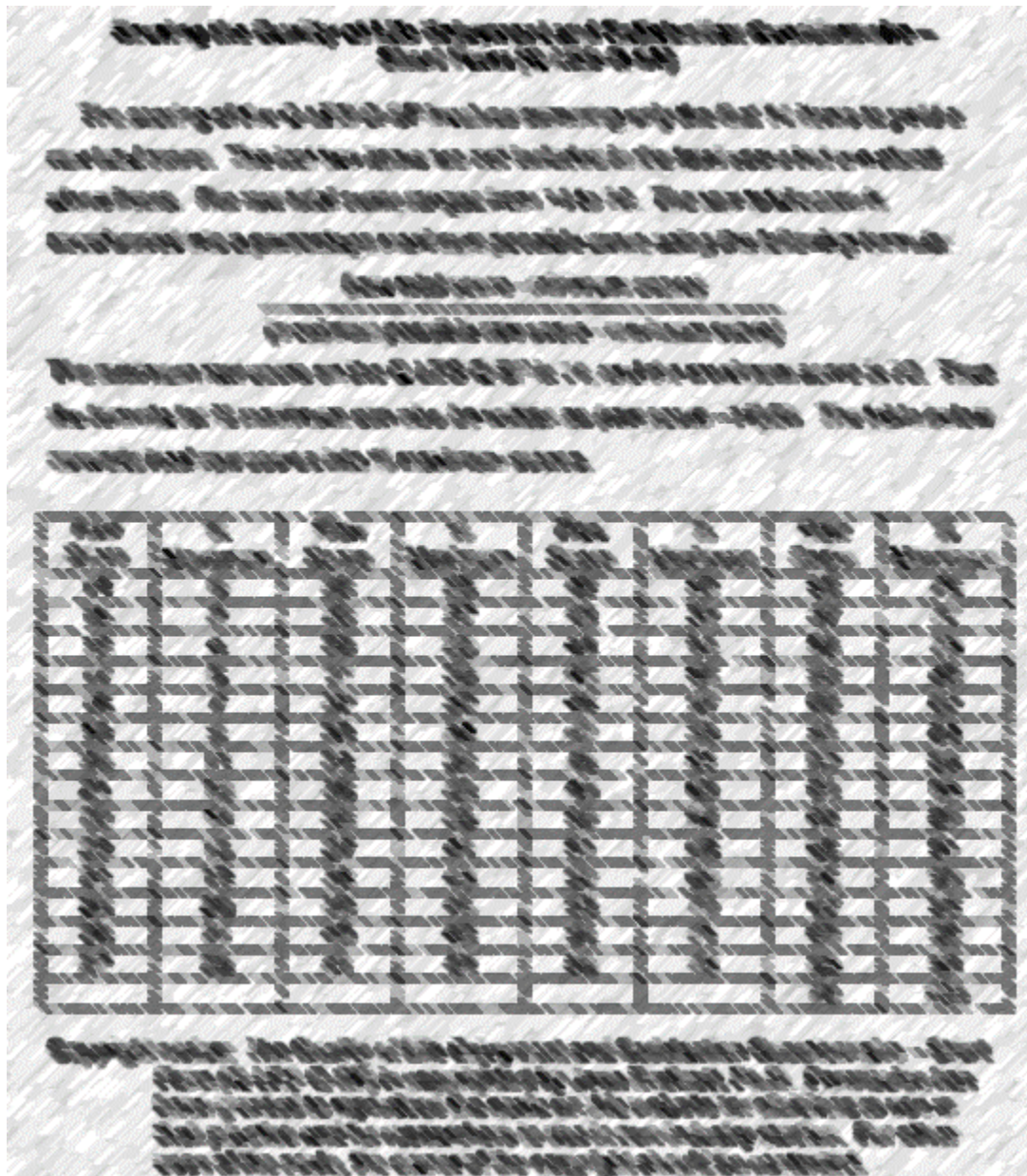Answer:
Liberty University

Question: Type of Study
Answer:
Survey (WEMWBS completed once only)

APPENDIX D

APPENDIX E

APPENDIX F

DIRECTIONS:

COMPLETE EACH ITEM OF THE 3 PAGE SURVEY. USE THE PENCIL PROVIDED. CIRCLE ONE RESPONSE FOR EACH ITEM. RETURN THE COMPLETED SURVEY TO THE INSTRUCTOR. YOUR PARTICIPATION WILL BE INCLUDED IN A RESEARCH STUDY. COMPLETING THE SURVEY IS CONSENT TO USE THE ANONYMOUS RESULTS.

CIRCLE ONE-

DEMOGRAPHIC INFORMATION:

Age-   50-59   60-69   70-79   80-89   90+

Gender- Male   Female

Do you live in a retirement community?- YES   NO

How many hours do you spend on a computer each day?- 0-1   2-3   4-5   6+

APPENDIX G

CONSENT FORM
THE RELATIONSHIP BETWEEN WELL-BEING AND THE NUMBER OF TECHNOLOGY
COURSES COMPLETED AMONG SENIOR CITIZENS IN INDIANA
Treg Hopkins
Liberty University
School of Education

You are invited to be in a research study to determine if there is a relationship between the number of technology courses a senior citizen completes and his or her well-being. You were selected as a possible participant because you have taken technology classes in Indiana and are 50 years of age or older. Please read this form and ask any questions you may have before agreeing to be in the study.

Treg Hopkins, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

Background Information: The purpose of this study is to determine if there is a relationship between the number of technology courses a senior citizen completes and his or her well-being.

Procedures: If you agree to be in this study, I would ask you to do the following things:
1. Complete a 3-page, 30-minute survey and return it to your instructor before leaving class today.

Risks and Benefits of Participation: The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

Participants should not expect to receive a direct benefit from taking part in this study.

Compensation: Participants will not be compensated for participating in this study.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

- Participants will not be asked for any personal, identifiable information and will complete an anonymous survey in a secure and private room.
- Data will be stored at Ivy Tech Community College's Mooresville campus in the faculty office storage room in a locked filing cabinet for three years. After three years, all records will be shredded using the campus shredding system.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey.

How to Withdraw from the Study: If you choose to withdraw from the study, please inform the researcher that you wish to discontinue your participation prior to submitting your study materials. Your responses will not be recorded or included in the study.

Contacts and Questions: The researcher conducting this study is Treg Hopkins. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at Thopkins19@liberty.edu. You may also contact the researcher's faculty advisor, Ellen Black, at elblack@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 1887, Lynchburg, VA 24515 or email at irb@liberty.edu.

APPENDIX H

[Insert Date]

[Recipient]
[Title]
[Company]
[Address 1]
[Address 2]
[Address 3]

Dear [Recipient]:

As a graduate student in the School of Education at Liberty University, I am conducting research as part of the requirements for an Educational Doctorate degree. The purpose of my research is to determine if there is a relationship between the number of technology courses a senior citizen completes and their well-being, and I am writing to invite you to participate in my study.

If you are 50 years of age or older and are willing to participate, you will be asked to complete a three page survey and return to your instructor. It should take approximately 30 minutes for you to complete the procedure listed. Your participation will be completely anonymous, and no personal, identifying information will be collected.

To participate, complete the attached survey and return to your instructor before leaving class today.

A consent document is attached to this letter. The consent document contains additional information about my research, but you do not need to sign and return it.

Sincerely,

Treg Hopkins
Student, Liberty University