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The Perceptions of Adults Adjusting to Low Vision and Using General Communications Technologies Including Online Forums

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This is to certify that the doctoral dissertation by

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

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The number of individuals facing vision loss as adults is increasing, and the need for these adults to have access to training and skills to aid in their adjustment process is prevalent. Guided by the tenets of connectivism, this phenomenological study examined current trends in social networking and the possibilities that are available to adults adjusting to low vision by using technology as a means for continued learning, social interaction, and professional connections. The main research question focused on the participants' perception of the adjustment process and their ability to learn and use technology. Data were collected through semi-structured interviews of 10 adults who had low vision and had attended some form of intervention. The experiences were recorded through the use of reflection that included memoing and inductive coding where themes emerged during the field process. NVivo software was utilized to clarify and present details about themes and patterns presented during the interview discussions. These themes detailed the participants' feelings of confidence and self expressed level of skills needed to use technology; the barriers to using technology, such as cost and time; and benefits of staying connected with technology. The findings from this study suggested that the ability to stay connected and to access information outweighed the barriers, although the participants expressed frustration with technological issues. The study contributed to an area of research that supports the benefits of continued training for adults adjusting to low vision. A process of training could be implemented that would involve general technology as well as assistive technology assisting individuals with continued success in their daily lives.

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Dedication

This is dedicated to my husband Bill, whose adjustment to adult-onset low vision provided a desire to combine educational goals with real life application. It is also dedicated to Remi and Gabi who have made life a joy, and to my grandfather who kept the inspiration by providing insight that life should be lived. Grandfather did not see the final copy of this paper, but we did get to spend our love with him.

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Chapter 1: Introduction

This chapter introduces the topic of study and provides background information as a foundation to understanding the research. From there it identifies the purpose of the study, and outlines the conceptual framework. The statement of the problem and research questions are identified which form the basis of the interview questions. The chapter also provides a definition of terms then concludes with the summary statement.

Overview of the Topic

The number of individuals adjusting to late-in-life low vision is increasing as the population of the United States shifts. According to The Eye Prevalence Research Group (2004), "Blindness or low vision affects approximately 1 in 24 Americans older than 40 years old" (p. 478). Low vision is not strictly an elderly medical issue, but an issue impacting a wide age range of adulthood. By 2020, it is estimated that the adult population with low vision in the United States is projected to be 3.9 million, which is 2.5% of the adult population (The Eye Prevalence Research Group, 2004). Consequently, many impacted with reduced vision will face difficult times adjusting to their lives, connections, and environments. The individuals could deal with depression, which can lead to diminished quality of life. According to J. Stelmack (2001), the researcher who studied the quality of life of persons with low vision, "visual impairment is significantly associated with decreased functional status, decreased self-reported quality of life, and increased emotional distress" (p. 336). Due to the impact of low vision on the life of an individual rehabilitation, training, and educational facilitation are integral to adjusting adulthood onset of low vision.

Low vision is a progressive eye condition related to the elderly; nevertheless, as the demographics in population shift, wider ranges of adults are being diagnosed with low vision (Congdon, Friedman, & Lietman, 2003). Two of the largest medical causes of low vision are cataracts and glaucoma (Kingman, 2004). Adult onset low vision usually affects the central part of the eye where the sharpest vision originates, causing a degragation of an individual's visual acuity (sharpness of sight), leaving only the peripheral vision (Resnikoff & Foster, 2004). Conversely, other adults can maintain central vision, but lose the peripheral vision; low vision can affect all areas of the eye (Kingman, 2004). Any degradation usually causes the eyes to become sensitive to light, to have distorted vision, or to lose their sensitivity to contrast. Although this particular condition rarely progresses to full blindness, it causes difficulties in carrying out routine tasks such as driving, grooming, reading, writing, or watching television (Babcock-Praziale & Williams, 2006; Stelmack, 2001).

The number of adults diagnosed with low vision is a global issue. Data from 2002 suggest that the number of visual impairments worldwide is already in excess of 161 million people (Resnikoff & Foster, 2004). Specifically, the increase in low vision rose from 10 million in 1990 to 18 million in 2002 (Resnikoff & Foster, 2004). The magnitude of numbers of individuals with low vision suggests the potential impact interventions could have on the adjustment process. The ability to connect digitally to family, friends, care providers, and economic entities aids individuals adjusting to low vision in the sharing of this information around the world.

This increasing statistics of late-in-life low vision has increased the prevalence of adults facing difficult adjustment to their decreased vision. This adjustment to low vision

affects their personal and social connections as well as their external environments (Guerette & Smedema, 2011). As such, adults may develop depression when they do not easily adjust to a state of reduced vision, which most of the time leads to a diminished quality of life. Stelmack (2001) completed a study that set forth the notion that adults with vision loss displayed a quality of life that described lowered self-esteem, which increased the levels of emotional distress. This described the idea of functional status for the adults with decreased vision.

A decreased functional status encompasses the performing of daily tasks, these routines have moved from route participation to a struggle to complete. The difficulty in daily functioning could be reason for the decreased self-esteem and increased emotional distress (Stelmack, 2001). The decreased self-esteem in conjunction with increased emotional distress lessens an individual's well-being and quality of life (Stelmack, 2001). The study concluded that rehabilitation, training, and educational facilitation are pivotal as well as integral to the adjustment of the onset of low vision in adulthood. Interventions can consist of basic technology skill learning that encourages participation. The intervention groups or facilitators may meet physically or virtually using technology to connect to online forums.

Background of the Study

For adults, low vision is the medical issue; the adjustment is the process of participating without the capability of vision. A review of a variety of interventions by Rees (2010) found "that a greater portion of individuals with vision impairment experienced depression" compared to those with normal vision. It is vital for adults suffering from decreased vision to remain connected socially with family, friends, and

colleagues. Such connections help adults with low vision to feel accepted and alleviate the circumstances and issues that might lead to depression. Christakis and Fowler (2009) assert that people with low vision who have exited the traditional public school system find it difficult to locate the means and resources supportive of their adjustment and acclimatization to a life with low vision.

Thus, activities of daily living, including communicating, become difficult. Public school systems provide a forum, or an avenue, where individuals with low vision may meet, learn, and share their strategies and experiences, thus encouraging one another to lead positive lives (Pearce, Crossland, & Rubin, 2011). Accordingly, most public school systems have allotted resources and means to providing in-school interventions and transition services. Christakis and Fowler (2009) assert that people with low vision who have excited the traditional public school system find it difficult to locate means and resources that support their adjustment and acclimation to a life with low vision. As individuals exit from the public school system and begin to experience low-vision, the process creates a disconnection that, so often, dampens the individual efforts to initiate and maintain social and economic relations. Interventions provided to adults are a means to provide some training in technology (Markowitz, Markowitz, & Markowitz, 2011). Learning and using technology by adults adjusting to low vision is a key to understanding the gap in the research that will be focus of this study.

A study by Hadley and MacLeod (2010) found that adults with low vision are depressed because tasks that they previously assumed to be normal and routine have become more difficult and sometimes frustrating. This frustration is evidenced by their precarious and laborious execution of daily tasks such as eating, bathing, dressing, and

grooming, which would not have been the case if they had their full vision (Cambron & Acitelli, 2010). Other documented examples of difficulties resulting from reduced vision include a difficulty in driving, fear of leaving their homes, and difficulties in moving about in unfamiliar environments (Ponchillia & Ponchillia, 1996).

Skills learned and understood through self-study or implemented by educational technology training can aid in the future use and comfort of adults adjusting to low vision. Social connections with familiar people such as family members and friends are vital in managing depressions and boosting the confidence of individuals with low vision (Guerette & Smedema, 2011; Mehdizadeh, 2010). Alternatively, if the inability to keep those connections becomes diminished, barriers such as depressive symptoms often prevail. The skill to use general (available to everybody, used by the general population) and assistive (used to enhance an experience that may have been diminished by a disability) technologies provides means for individuals with low vision to connect with their counterparts, health professionals, and well-wishers through social networking forums (Fok, Polgar, Shaw, & Jutai, 2011).

Online connectivity provides the avenues for individuals with low vision to work from familiar surroundings, like their homes, and at the same time, join social groupings and share their experiences, fears, and successes (Mulloy, Gevarter, Hopkins, Sutherland, & Ramdoss, 2014). This ability to socialize online, as documented by Mehdizadeh (2010), is essential to the realization of positive effects for individuals with low vision to accept and adjust to the condition. Many of the assistive technologies necessary for this connection are already built into many online sites, such as the ability to increase the font size or change the color background of a computer screen. However, individuals feel

intimidated when using the general technology such as social networking websites, e-mails, instant messaging services, and calling applications such as Viber and Skype. They may also not understand how to use and access the assistive abilities built into the sites.

The use and effectiveness of the online forums solely depends on the user's skill level and a desire to acquire new knowledge (Baym, 2010). This is so because online forums require some level of technological skill, an ability to use digital communication, and an understanding of the workings of the online forums. In addition, online use may also depend on previous participation, or use of online forums, and an individual's acceptance and confidence in using technology by an individual. All these are vital as part of an intervention process that connects adults with low vision to their counterparts.

Networked, technological, and social landscapes of learning characterize the digital era, according to Dunaway (2011). For instance, the Internet and social networking allow individuals to access numerous informational resources that include Web 2.0 tools like RSS feeds, social tagging, and bookmarking tools for media sharing and peer-to-peer resources (Cormode & Krishnamurthy, 2008), providing a means to share and gather resources. The description provided in Cormode and Krishnamurthy (2008) supports the use of technology, especially social networking, and its benefits to the adjustment process of adults with low vision. Social networking provides a means to communication and leading of connective lives by adults with low vision. However, the use of technology is not as straightforward as one may believe. This is because creating and maintaining online connections require a certain skill level coupled with a desire to acquire new knowledge for adults with low vision (Baym, 2010). Additionally, the use of social networking sites depends on an individual's ability to use digital communication

and have basic understanding of the workings of such social networks. Further still, online social media may be dependent on previous experience and participation of an individual on online forums, the individual's acceptance, and willingness to use online forums.

Furthermore, the facilitators' teaching of online forums should take into account the different levels of exposure and use of online technologies by adults with late-in-life low vision. These online forums allow the individuals who are suffering from low vision to communicate with their friends and family members (Manduchi & Kurniawan, 2012). The online forums can be regarded as the form of technology that presents individuals to interact with each other with ease. For instance, some adults may only have a peripheral knowledge of online technologies, while others have exceptional knowledge, but still require guidance. A study by Karagiannidis, Efraimidou, and Koumpis (2010) demonstrated that adults have a desire to belong to forums or groups so that they may interact and share ideas with members facing similar predicaments as they adjust to life with low vision. These technologies allow individuals the ability to actualize these desires for connections and provide a forum for learning through connecting and for continued participation in life.

Statement of the Problem

My husband is legally blind, thus, he does not drive. However, his sight ability is actually considered low vision rather than blind. He attended an intervention class, and this process connected my interest in this research and provided a network of participants who were interested in being interviewd.The present study investigated the perceptions of adults using general social networking technologies. The purpose of the study was to

understand the lived phenomenon, “the natural experience” of the adults who received training through an intervention that incorporated general technology training in conjunction with making online connections as they adjusted to low vision. The intention of this investigation was to understand the essence of the digital connections on the adult onset low vision adjustment process.

The study examined how adults perceived the use of technology during their adjustment to low vision. Technology is a means of support in the adjustment process. The understanding of technology use and adults with low vision can lead to further research and examination to find out the viable abilities needed to connect and increase interaction, thus revealing the need to manage the level of depression in adults with low vision. The study focused upon the individuals who have recently experienced low vision and were facing difficulty to carrying out their regular tasks. Technology enhances the adult’s interaction with their friends and relatives, which might have been a decreased or limited interaction due to low vision. This study was based on the foundations guided by the theory of Connectivism and the impact on the adjustment process of adult onset low vision.

Among different aspects associated with low vision, a small amount of evidence is present regarding the adjustment of individuals experiencing low vision with technologies. Therefore, further research is required in this aspect. General technology is mainstream, available to all people, yet has ability to positively impact individuals with low vision. Mainstream technologies provide a medium for social and economic connections by adults who are adjusting to low vision. The gap to be filled for this research focused on the possibilities that general technologies could provide and the

perceptions of using these general technologies by adults who are adjusting to their daily lives with reduced vision. The review of the literature indicated a gap that focuses on interventions, but does not look to the possible incorporation of not only assistive, but also general technology education. The learning and usage of general technology could aid in adjustment to daily connections and positively influence adults with low vision.

The preceding notion gives primary focus of the present study's exploration of Connectivism. The theory of Connectivism describes an opportunity that benefits individuals who are adjusting to late-in-life low vision and their abilities to do so using technology. Connectivism promotes a meaningful platform for social networking as a means that adults with low vision continue to be active and meaningful participants in their personal, social, and economic groups. Christakis and Fowler (2009) posit that the use of technology is intended to provide low vision individuals with an avenue to continue as members of groups as well as network in such groups with dignity and give them a continued feeling of self-worth.

In many cases, educating adults with low vision is outside the realm of health practitioners' professions. In such instances, the health practitioners should give them suggestions and/or references for their aid and possible support (Downes, 2007). Depending on the needs of the individuals and availability of funding from either or both local and federal agencies or from private organizations, minimal services are available. These limited services do not go a long way in aiding, locating, and setting up of a technological system that will enhance continued communication between individuals with decreased vision. However, if more services are available, they might positively

influence the learning of new technologies by low vision individuals, thus aiding in their virtual connections.

Research Questions

The research questions used in this the study were:

1. In what ways do adults adjusting to low vision describe changes in their daily lives due to low vision?
2. In what ways do adults with low vision perceive and understand the role of intervention training with computer skills that encompass online social networking and living with low vision?
3. What do the adults with late-in-life low vision perceive as barriers when using online social networking?
4. What benefits do adults with late-in-life low vision perceive when using online social networking?

Purpose of the Study

The purpose of this study was to understand the lived phenomenon and natural experience of adults adjusting to low vision who received training through an intervention that incorporated general technology training in conjunction with making online connections as they adjusted to low vision. The intention of this investigation was to understand the essence of the digital connections on the adult adjustment process to low vision. The study population was purposefully selected as a sample of convenience that included adults who either had completed or were attending intervention courses provided by the state of Pennsylvania or a county program under the Rehabilitation Act

(29 U.S.C. 794). This study provides an understanding of the essence of the participants' experience by "unraveling the elements" of the proficiencies needed through the appreciation of the participants' perspectives and constructing themes in the "values" that form their existence (Moustakas, 1994; Patton, 2002). This understanding will in turn prove pivotal in the future design and plan of technology used in training as an intervention and rehabilitation strategy for an individual with late-in-life low vision.

The main objective of this study was to examine the quality of connections made by adults adjusting to late-in-life low vision and their continuation of their daily lives using online forums. Two secondary objectives were to examine the use of technology in the adjustment process and to examine the perceptions of adults using the technology and the effects to their adjustment process. Further, as derived from the stated purpose of the study, additional research objectives were formulated. The objectives were purposively made narrow, measurable, and specific, such that, the objectives are easily attained, coded, and translated into the purpose of the study.

Conceptual Framework

This conceptual framework is largely based on Siemens' (2004) learning theory of Connectivism in conjunction with Goffman's theory of presentation of self, which aided in describing the phenomena that occurs in the experience of social interaction for adults learning and using digital connection in the process of adjusting to low vision. Seimens' Connectivism guides an understanding of the impact of technology on learning and connecting in the digital era. Goffman's theory has resurged and is cited as a way to understand how people present themselves and interact in the digital forum (Hogan, 1998). The Connectivism theory allowed the researcher to understand the ways in which

adults perceive and understand the role of intervention training with computer skills that encompass online social networking and living with low vision. In contrast, Goffman's theory allowed the researcher to explore the benefits adults with late-in-life low vision perceive when using online social networking.

Connectivism

Connectivism Theory is a learning theory based on the concept that learning takes place between connections among a teacher, a student, and learning materials and/or instructions. From this concept, Seimens (2004) and Downes (2007) modeled the Connectivism Theory to explain complex learning while, simultaneously, considering the rapid changes taking place in the digital social networks. It is a learning theory modeled for the digital age, where technology has networked the world. People have networked with others in different geographic locations and it has networked people with differing abilities. The basis of this learning theory is the fact that foundations are decisions based on a rapidly changing world, implying that new and incremental information is continually being acquired.

According to Siemens (2008), Connectivism Theory is founded on eight principles. The first principle of this theory states that learning and knowledge is based on diverse opinions. Under the light of this principle, it can be suggested that the process of learning and gaining knowledge can be carried out in multiple ways. The second principle of this theory states that learning is a process that connects various sources of information. According to this principle, the procedure of learning promotes the amalgamation of information sources. The third principle of this study signifies that learning may take place from non-human appliances. It can be interpreted from this principle of

Connectivism Theory that apart from human resources, the process of learning can be executed through non-human appliances (Tschofen & Mackness, 2012).

The fourth principle is that the capacity to seek for more knowledge is more important than the current knowledge. According to this principle, it can be suggested that the process of learning should be regarded as an ongoing process because the building of capacity to learn more is more crucial than acquiring a limited amount of knowledge. The fifth principle of this theory states that making and maintaining connections is necessary to facilitate learning. Consistent with this principle, it can be acknowledged that establishing contacts, including online contacts, fosters the process of learning. It is widely accepted that the more interaction with people, the more a person gets a chance to learn (Tschofen & Mackness, 2012). The sixth principle suggests that it is a core skill to connect fields, ideas, and concepts. The seventh principle states that up-to-date knowledge is the main purpose of Connectivism learning activities. Under the light of this principle, it can be interpreted that the chief aim of all Connectivist-learning activities is to maintain a forum of latest knowledge. The last principle of this theory states that decision-making is a form of learning process (Tschofen & Mackness, 2012). Through making decisions and experiencing their outcomes, people come to know about new concepts and strategies.

Usually, adults acclimatizing to late-in-life low vision are more likely to maintain a feeling of relational proximity if they maintain personal and social connections. Applying Seimen's Connectivism Theory is to postulate that adults who are acclimatizing to low vision can also maintain access to information, facilitate learning, and maintain connections using general technology. The basis of the Connectivism Theory states that

to be a part of a digital age, an individual has to encompass the ability to learn in different and faster settings with the ability to take part in a faster age of communication. While this theory is applicable to all people presently learning, it is also relevant to adults who are adjusting to low vision, and who embrace technology to stay connected to people for social and economic reasons (Bell, 2010). A means for adults with low vision to participate in the faster-paced digital world is to learn and use technology.

According to Downes (2010), Connectivism and connective knowledge encompass all the principles of Connectivism Theory. They are essential in designing learning strategies in today's complex and adaptive world against the backdrop that the use of traditional mass education does not adequately meet the needs of the industrial future; thus, it requires total re-conceptualization. The traditional education system does not comprehend changes, lacks vision, and needs innovation, conceptualization, and to rebuild rather than re-tool education. Connectivism and connective knowledge considers today's complex and dynamic needs of learning, like networks, technology, decentralization, knowledge growth, globalization, control shift, and blurring realities between the physical and virtual worlds. This shows that distributed knowledge representation, where networking is the learning and each learning task requires a different approach, the content needs to be driven by individual need. The need is determined through the context and resources. Downes (2010) adds that for adults to benefit from Connectivism and connective knowledge, they should be able to navigate an information background, evaluate or authenticate a knowledge source, create a personal learning network, think critically and creatively, recognize patterns, and accept uncertainties, like moving forward with the best option.

According to the Connectivism Theory, an in-depth understanding of the application of technology to social interactions of individuals with late-in-life low vision could make a significant difference between the initial feelings, connections, and adaptations of these individuals prior to their condition of low vision and when they progressively developed low vision (Bell, 2010). To this end, according to one of the principles of the Connectivism Theory, learning is like nurturing, where maintaining connections is pivotal to facilitate continual learning, filling possible gaps, and breaking down possible barriers encountered by adults adjusting to a life with low vision and their continued participation in social networking (Siemens, 2004).

Connectivism as a New Learning Theory for a Digital Age. According to Siemens (2014), intensification of the society and exponential development of knowledge necessitate non-linear models of understanding and learning. With a contemporary approach, individuals cannot classify themselves as knowing/learning beings (Tschofen & Mackness, 2012). Due to advancements in technologies and emergence of the Internet, digital cities that work together on a broad spectrum of topics have turned out to be a collaborative network that links societies globally as well as locally. This shift in paradigm and increased utilization of social networks has fostered the instructors to employ this innovative technology (Tschofen & Mackness, 2012). According to the point of view of Siemens (2006), the transfer of knowledge has transformed from hierarchies and categories to different ecologies and networks. There are two underlying principles that foster the integration of knowledge (Clara & Barbera, 2013). The first principle states that knowledge characterizes a portion of an individual's existence, whereas the second principle notes that is beneficial to perform a certain action. The perceptions

regarding the experiences of knowledge in the past are significantly altered by viewing knowledge and learning as a network phenomenon (Clara & Barbera, 2013).

Self-Presentation. Apart from Connectivism Theory, the study also drew from theories that relate to the forming of relations based on roles and personalities as well as from ideologies of formation and maintenance of social networks. Hogan (2010) carried out a study important to the present study. Hogan (2010) examined the theory of Self-Presentation as authored by Goffman (1959). Self-Presentation Theory is a theory that describes the perception of an individual towards oneself. It theorizes the processes that people use to influence, purposively, how other people may perceive their beliefs and feelings. The Self-Presentation Theory presented by Goffman explains that when an individual interacts with others, two impressions are given: the first impression is provided by the individual, whereas the listeners provide the second impression. The Goffman theory proposes that each individual builds a performance by utilizing verbal and non-verbal tools and physical settings which affect their facial expressions.

A research study conducted by Goffman (1959) observed that to have an in-depth understanding of social behaviors, there is a need to scrutinize and systematically observe the displayed public behaviors of people towards other people, rather than probe their motives or personalities. Such an observation is helpful to adults with low vision in the manner they conduct themselves while adjusting and accepting a life with reduced vision. The chief purpose of the Goffman theory is to determine the way in which an individual in ordinary circumstances presents himself and his activities to others. However, the purpose of incorporating Goffman's theory in this study is to understand under the light of this theory how the individuals with reduced vision present themselves and their

activities to others. This theory is vital for this research, as it will assist the researcher in understanding of the impact of online connections and networks to adults adjusting to low vision. According to Goffman (1959), the Self-Presentation Theory is based on four aims: understanding an individual's behavior from the perspective of the observer, assuming that self-presentation is legitimate, widening up the scope of discussion outside personalities, and predicting the effects of criteria validity ranging from positive to negative.

In his examination, Hogan (2005) described the Goffman theory as increasingly popular as a means for explaining differences in meaning and activity of online participation. Additionally, the knowledge of how individuals and groups identify themselves could provide an understanding of the impact of online connections and networks to adults adjusting to low vision. The Self-Presentation Theory gives importance to the way adults with low vision carry themselves in public rather than the motives of their actions to achieve and maintain connections helpful in their adjustments. Online relationships differ in content and depth, similar to face-to-face relationships. Thus, the Self-Presentation Theory indicates that how individuals present themselves could hugely influence the type of relationship they establish. Although the application of this theory to public relations and business undertakings has been successful (Bullingham & Vasconcelos, 2013), the elements of the theory are much adaptable and essential to the making and maintaining of relationships through social medium. This signifies that the principle used and elements of these tools can be employed to establish and sustain relationships with others.

The theoretical foundations provide guidance and means of understanding for the implications of presentation of self on the connections made using networking, particularly online forums. Also, whether the relationship aids in understanding of how quality of the relationship is perceived through online forums. In addition, whether the relationship has an impact in the process of adjustment to individuals with low vision late in life (Lin, Jan, Lay, Huang, & Chen, 2014). Relationship quality can influence the acceptance of the use of technology.

Operational Definition of Terms

This dissertation used few technical terms and concentrated on the plain language. This section identifies the terms adults with low vision, late-in-life low vision, and adult onset low vision are used synonymously. The terms are listed as below.

Assistive technology: devices used to enhance an experience that may have been diminished by a disability (Manduchi & Kurniawan, 2012).

Blind and partially sighted: These terms are used interchangeably; however, partially sighted "accentuates the fact that any remaining vision is useful (Hogan, 2010).

Connections: Personal, social, and economic interactions between an individual with family members, colleagues and other individuals afflicted with low vision (Barabasi, ,2003; Christakis, & Fowler, 2009).

Connectivism: The implementation of network principles to define both knowledge and the process of learning (Siemens, 2004).

Connectivism Theory: A theory that explains the relationship between the use of technology to training and social interactions of adults diagnosed with low vision (Siemens, 2004).

Connecting sites: Web sites that are not bounded by social networking systems, but allow people to connect and talk, chat, view, and/or video chat online. Examples of these sites include Skype, Joinme, and Team Speak (Boyd & Ellison, 2007; Downes, 2007).

Disability, handicap, or challenge: A condition where the sharpness of sight is degraded to an extent that clarity of vision is no longer guaranteed or becomes a task in itself (Corn & Erin, 2010).

Depression: A medical condition that makes an individual feel sad and anxious with symptoms such as lack of sleep (Guerette & Smedema, 2011).

General technology (mainstream technology): Available to everybody, used by the general populations, used only or in conjunction with assistive technology. Emiliani, 2006).

Late-in-life low vision: Adults who have exited the schooling system and then develop low vision (Corn, & Erin, 2010.

Low vision: A progressive eye condition that impairs the correct functioning of the eyes, usually causing reduced field of vision, sensitiveness to light, and distortion of vision and loss of visual contrast (Jose, 1983).

Online Spaces: The different places used to communicate to gather information on the web. They have been differentiated as performance, behavior, and exhibition spaces (Hogan, 2010; Goffman, 1959).

Phenomenon: The content of a study being examined by the researcher. The understanding of the participants' experiences of a study (Creswell, 2009).

Phenomenology: The lived experiences of the individual participants of a study

researched and communicated in a manner to which a universal understanding is established (Marshall & Rossman, 1999).

Rehabilitation training: Bringing or restoring an individual to their normal or optimal state (Ponchillia & Ponchillia, 1996).

Social networking sites: Web based sites that allow individuals to maintain a profile that is used to communicate through others through various sites such as Facebook and YouTube. In addition, it allows the users to keep and maintain connections within those and with other web-based systems (Boyd & Ellison, 2007).

Self-Presentation: The way individuals behave in public to create a personal impression on those around the individual (Hogan, 2010; Goffman, 1959).

Social Networking Online: It refers to the utilization of Internet-based resources to establish connections with relatives, friends, clients, and customers. For the purpose of this research, I will combine these as the means, the tools, places, and the connections individuals can communicate via Internet forums (Walter, Althouse, Humble, Smith, & Odom, 2007).

Digital Exclusion: It refers to the social and economic inequality as per the classification of individuals in a given population to access information over Internet-based technologies. (Warschauer, 2004).

Study Assumptions

The study is based on the lived experiences of the participants, thus, it is assumed that the participants will answer the questions and participate in the experience honestly. A qualitative study is dependent on the participants sharing information, being articulate, and recalling the situations they have experienced (Yin, 2011). There will be

confidentiality in the gathering, recording, and presenting of the participants' information. Participation will not be required.

One limiting factor on the study is the investigator/researcher's ability to separate preconceived notions from described perceptions of the participants. The essence of the experience needs to be from the view of the participant and not swayed by the researcher. This is one of the difficulties of producing a phenomenological qualitative study (Creswell, 2009), and a potential limitation of this study.

Scope and Limitations

The scope of the present study is limited to the United States of America because of the study's interest in the region. Moreover, the reason for limiting the scope to this region is the ease of availability of data, accessibility of research respondents. Due to academic and financial limitation, the researcher was unable to access participants of different regions, thereby limiting the scope to United States. The region holds the largest numbers of adults diagnosed with late in life low vision (National Eye Institute, 2012). The population was purposefully selected as a sample of convenience that included adults who either have completed or are attending intervention courses provided by the state of Pennsylvania or a county program under the Rehabilitation Act. These adults formed the target population for the present study. Furthermore, the use of relevant literatures and statistical analysis will aid the present study to understand the effects of social networking on adults adjusting to late-in-life low vision; thus, provide guidance on the choice of research methodologies, data collection instruments, and process.

One of the major limitations of this study included the accessibility to the applicable literature because the retrieval of articles available through databases in full-

text was complicated. In addition, it was complicated to embrace all the information in the review, as large volumes of literature cannot be compiled in brief. Inclusion of the articles published in English language has resulted in the exclusion of considerable amounts of exclusive literature. The limited time period was also a constraint, as the search of the relevant databases was performed in a predetermined phase of study period. Another limitation is the smaller sample size associated with the present study. The researcher was unable to target a larger population, which limited the access to a greater number of perspectives. However, process will generate and use raw data from interviews, discussions, and participant journaling of the individuals who are adjusting to low vision and have completed some intervention.

The conversations occurred over the phone, in person, or through the medium relevant in the study: online forums. Reviews of previous studies will not be used to further the research analysis, but rather present the drawbacks encountered and assumptions made as well as a general understanding of the effects of social networking on adults adjusting to a life with low vision. However, this study is presented to "understand the nature and meaning of the experience" of the adult who is adjusting to low vision and his or her perception of technology in that process (Moustakas, 1994). The primary source of data is the analysis from reported experiences of the individuals recounted through questionnaires during conversation/interviews, observation, and journaling.

Significance of the Study

The outcomes of the study are significant to a variety of stakeholders who are impacted, interested in, and working with adults adjusting to low vision. To researchers, the study contributes to a body of information about the dignity and worthiness of the human experience with regard to adjustments to low vision late in life. On the same regard, this study identified a gap in previous researches on the feelings of isolation and frustration of adults adjusting to low vision late in life, as well as examined the possibilities of current trends in digital connectivity and networking opportunities intervening in such situations. An understanding of the elements of social networking and the quality indicators of relationships are relevant in initiating and maintaining connections that aid in adjusting to low vision late-in-life. Exploring and defining the experiences of individuals with late-in-life vision provides useful information for rehabilitation process.

Such information is crucial for future training and understanding familial and relational dynamics as a component in the adjustment process. The study may identify the means for individuals to manage phases of depression during adjustment and enable them lead normal lives. The study promotes positive social change by providing insight from adults with low vision and their experiences through the adjustment process. The experiences provided by the adults of this study allow others in similar situations access to information about possible benefits of maintaining and making connections through technology. The findings will also enable adults with low vision to understand their conditions and easily accept assistance, even in tasks they once considered routine, without developing feelings of depression that perpetuate and lead to isolation.

Summary Statement

This section of the dissertation presented the background of the study and the statement of the problem that has directed the researcher to carry out a research on the selected topic. It has been identified in this chapter that there is an increase in the numbers of adults diagnosed with late-in-life low vision and reduced vision that could make adults feel fearful of venturing into unfamiliar environments. These vision impairments have turned routine tasks such as eating, bathing, grooming, and dressing amongst others, into an exercise. Adults in the adjustment and living stages of vision loss may require assistance to carry out routine tasks. As such, the adjustment process of adults to accept and lead normal lives with reduced vision increasingly leads to depression.

Therefore, to make the adjustment process as humane and as easy as possible, social interactions with family members, colleagues, and other adults experiencing a similar condition, and situation, is vital. Similarly, the use of technology, more so, online forums, is pivotal to enable these adults to connect with others diagnosed with a similar condition and share their experiences and fears, thereby making the adjustment process easier. Additionally, the use of online forums prevents them from venturing into unfamiliar territories to hold social gatherings because they would interact digitally in the comfort of the familiar surroundings of their homes. Technology education incorporated into interventions may aid in the lessening of the barriers felt by adults with low vision.

Thus, the purpose of this study was to examine the perspectives of the individuals who are receiving, and who have received training through interventions as they adjusted

to late-in-life low vision and participate in social networking and making connections through online forums. The research questions that were mainly emphasized throughout the study include: In what ways do adults describe changes in their daily lives due to low vision? In what ways do adults perceive and understand the role of intervention training with computer skills that encompass online social networking and living with low vision? What do the adults with late-in-life low vision perceive as barriers when using online social networking? What benefits do adults with late-in-life low vision perceive when using online social networking? This chapter presented the significance of the study to the stakeholders who are affected, interested in, and working with adults adjusting to low vision and to the researchers who desire to conduct a study in the same context. The same segment of the research highlighted the scope of the research that was limited to the United State of America and all the potential limitations that have been confronted by the researcher in the entire course of the research. Chapter 2-literature review presents facts concerning the causes and prevalence of low vision among adults and describes the barriers to the adjustment process.

CHAPTER 2: LITERATURE REVIEW

This chapter provides a comprehensive literature review of previous and current research on the barriers to adults with low vision, adjusting to lives with reduced vision, and the values and benefits brought by technology in the aid of their adjustment process. This literature review is divided into two main phases. The first phase focuses on the barriers to adults adjusting to low vision, in particular, their personal, social, and economic connections. The second phase examines the available information and data regarding assistive and mainstream technology in the intervention and adjustment process. A focus of this inquiry is the use of online forums, and their effects on the adjustment processes of adults with late-in-life low vision. Incorporated in this chapter is a review of the conceptual framework. It includes a review of the phenomenon that will be used for the study portion of the dissertation. Ultimately, the chapter concludes with a brief summary of the literature review.

Literature Search Strategy

Two types of research sources were searched to provide literature for this review. First I traveled to offline libraries to search for books and journals written within the last decade detailing adult adjustment to low vision, and the relationship to their personal, social, and economic connections. Second, I searched online libraries for peer-reviewed journal articles, reliable web content, and textbooks. The journal articles were screened for studies that included in their study outcomes, or parts of the outcome, dimensions of the barriers to an adult adjusting to a life of low vision, and/or the value of technology in the adjustment process. The online search was completed through the Walden Databases using EBSCO, ERIC, and academic search engines.

However, the search was not limited to these search engines. Accordingly, a search at other university library sites, as well as Google Scholar, and Sage Journals were also done. The online searches lead to scholarly entities and some instances the same articles kept returning within the search parameters. In order to make the research confine, the keywords that were mainly used by the researcher for searching the relevant material include adults with low vision, adjustment to low vision, interventions for low vision or blindness, barriers, and concerns with low vision. The results were further narrowed using keywords depression with low vision, loneliness, loss, and adaptation. The search for research on content focusing on the benefits of technology and learning used the key terms Connectivism, benefits, social media, online forums, and feeling connected

Pemberton (2010) suggested that due to the pace of information in the digital age, it is unlikely that this search is exhausted, or ever fully completed. New and possibly pertinent data are generated faster than ever before, available on means never used before, but the necessity to complete the research restricts the tracking of constant updates. For this dissertation, my goal was to uncover what was already known to build the parameters for this, review the literature, and identify the areas where there is a lack of literature. The articles and materials were found using key terms “adults with low vision,” “adjustment to low vision,” “interventions for low vision or blindness,” “barriers,” and “concerns with low vision.” The information was narrowed to “depression with low vision,” “loneliness,” “loss,” and “adaptation.” The content focusing on the benefits of technology and learning used the key terms “Connectivism,” “benefits,” “social media,” “online forums,” and “feeling connected.” The articles were to be

centered on a decade in time, but many references exceeded that limit and were still used to aid in support of research.

Low vision is a progressive eye condition that degrades the visual acuity of an individual. Low vision is associated with degradation of the normal functioning of the central part of the eye where the sharpest vision occurs, thereby leaving only the peripheral vision working normally (Babcock-Praziale & Williams, 2006). However, many parts of the eye can be affected leaving spots of vision. The resultant loss of visual acuity causes the eye to become sensitive to light, distorts normal vision, or causes vision to lose contrast (Babcock & Williams, 2006). Furthermore, medical, pharmaceuticals and surgical methods, as well as the use of conventional methods like prescriptive lenses, are inadequate in the managing of several visual conditions (Walter et al., 2007).

The lack of effective medical interventions to manage adult reduced vision has necessitated in the development of health care and rehabilitation services to manage and control the possible impacts of permanent reduced vision (Markowitz et al., 2011). These services are primarily intended to ensure the use of the remaining vision to its fullest potential. Doing so aids the affected adults in acclimatizing and adjusting accordingly, enabling them to lead normal lives (Stelmack, 2001).

Causes and Prevalence of Low Vision Among Adults

The prevalence of adult onset low vision has a positive probability of increasing as the population of the United States increases. Eye Diseases Prevalence Research Group (2004) projected a "cause-specific prevalence and distribution of blindness and low vision in the United States by age, race/ethnicity, and gender, and found that approximately 937,000 (about 0.78%) of Americans over 20 years," old suffered from

low vision. Congdon et al. (2003) further projected that by the year 2020, these numbers will increase to 70%. The projected increase of numbers of individuals with low vision and blindness is correlated to the rising numbers in the aging population and the increased life expectancy in the United States.

The causes of low vision vary significantly according to race/ethnicity, gender and age. For instance, Congdon et al., (2003) found out that in 54.4% of Whites, the primary cause of the condition was macular degeneration, while among Blacks, cataracts and glaucoma accounted for 60% of all the recorded cases of low vision. Other causes of low vision that were not as significant included inherited diseases, glaucoma, and diabetes (Stelmack, 2001). However, researchers Stelmack (2001) and Congdon et al., (2003) noted that the causes of vision conditions are not discriminatory and that all or any of these could affect any person. Some vision issues show greater ties to genetics (www.glaucoma.org). Popivker et al. (2010) looked at the numbers of vision loss in midlife, concluding that "as many as 15% of adults aged 45-65, representing 9.3 million middle aged Americans report having some type of vision problem" (p. 1128). The statistic in the Popviker, Wang, and Boerner (2010) study describes some sort of vision problem as compared to Congdon et al. (2003), which describes a statistic of low vision and blindness. The information being presented shows that the increasing numbers of individuals with low vision does only not begin during youth, but is a part of life and occurs at any time in one's life.

Adjusting to adult low vision is not strictly an issue within the borders of the United States. Low vision is occurring around the world. Wright (2010) indicated that low vision affects approximately 314 million people worldwide, and that number is

projected to rise by a staggering 20% by the year 2030. Wright primarily attributed this to today's increased life expectancy and a relative increase in the number of older people worldwide. In 2010, Wright concluded that adults with vision issues suffered from "psychosocial and functional" consequences. These results included social isolation, diminished productivity, functional disability, and a loss of quality of life. These concerns together, or separately, accounted for the high prevalence of depression among these adults with vision issues. Wright (2010) acknowledged that depression is a major concern with adults dealing with the adjustment to lives with decreased vision. It can impact the continued living of functional, and what are considered as normal lives, or lives that have a decreased functional status.

Barriers to the Adjustment Process

A study by Gold, Zuvela, and Hodge (2006) of people 60 years and older focused on vision loss and adjustment and explained that one of the difficulties in diagnosing people with low vision is a barrier to the adjustment process. Many people, especially adults, are diagnosed in the late stages of vision loss. This resistance to diagnosis can be due to many reasons from fear, denial, or just lack of knowledge that the vision is decreasing. Lack of acceptance to low vision hinders the initial acquisition of services. The same study collected survey data from 1405 Australians and provided the following results. At the time of the study, 67 percent of the survey participants believed that their independence would be lost if they lost their vision. Sixty-five percent stated that using transportation, especially public transportation, would be an issue. A slightly lower percentage, 50 percent, believed that continuation of education would be a challenge. Seventy-five percent believed that employment would be hindered.

Both tangible and perceived barriers can hinder the adjustment process of adults with low vision. Cambron and Acitelli (2010) showed that adults with late-in-life low vision had difficulties adjusting to living with the condition. Cambron and Acitelli (2010) indicated that there are barriers inherent in the affected adults that made their adjustments difficult. Therefore, the consequent discussion focuses on the barriers to adults with late-in-life low vision adjusting to lives with reduced vision as synthesized from several current and previous studies. These barriers include inability to carry out daily living tasks, depression, anxiety, dependency, stigma, and loneliness (Matti, Pesudovs, Daly, Brown, & Chen, 2011). The sections below describe each of these barriers in detail.

Inability to Carry Out Daily Living Tasks

Diagnosis of low vision in many adults is associated with a complex web of emotions. Among them is a loss of self-esteem or a loss of self-control brought about by an individual's inability to carry out a normal range of competencies or daily living tasks (Cambron & Acitelli, 2010). Wright (2010) recognized significant losses such as independent travel, grooming, eating, writing, and reading. These losses affect an individual's sense of intrapersonal control. Wright (2010) revealed that low vision greatly affects an adult's ability to carry out daily living tasks and participate in social activities; thus, low vision is a good predictor of functional decline with time. Again, because planning usually takes efforts in organization, approximately half of the adults with late-in-life low vision either live alone or have inadequate training on the best methods to carry out daily tasks such as grooming (Hadley & MacLeod, 2010). These factors of living alone in conjunction with inadequate intervention early on can impede the individuals' efforts to adjust to living with low vision.

Understanding the negative effects of low vision on carrying out daily tasks, Weih, Hassell, and Keeffe (2002) described varying experiences associated with low vision in adults. For instance, a tailor who loses the ability to sew, because of low vision, will despair more than an individual who is not a tailor. Hence, the person who previously completed the task of sewing as a professional now struggles, because there was a change in the abilities to complete that same task. Low vision changes the ability and could affect the product. The person who was not a professional tailor may then have the advantage of full sight and complete the task with less difficulty. Weih et al. (2002) inferred that how an individual reacts to a loss of a particular ability would determine the need to assess any visual rehabilitative interventions for that individual. As such, Weih et al. (2002) primarily focused on the effects of low vision on activities that were of utmost importance, even at times a livelihood, for an individual. Focusing on visual symptoms that aid in the adjustment process, which lessens the barriers to late-in-life low vision, can aid in participating in daily activities. The completion of the activities may involve learning alternative means to participate in the activities compared to methods used previously.

Individuals with vision loss give priority to perceived visual functioning more than clinical measures, and their experience of disability or reduced functionality is borne of people's reaction to their condition (Conole, Galley, & Culver, 2011). Goffman (1959) observed the behavior based on the perception that how well adults with low vision can see is dependent on physiological, psychological, and emotive factors. The adults' interests lay not in clinical measures and indicators of the intensity of their condition, but rather how clinical interventions would improve the quality of their lives. The barriers did

not have to subject the individual to a feeling of loss, but with interventions, changes could be applied that could maintain participation in their daily lives.

Vision deterioration affects the safety of adults with low vision within their homes. Their everyday life can be different, which makes adults unable to carry out effectively daily tasks; thereby, individuals may feel lonely and isolated. This inability to carry out daily tasks, as well as feelings of loneliness and isolation, accounts for significant barriers to their adjustment and acclimatization to living with low vision. Guerette and Smedema (2011) demonstrated that adults with low vision had reduced abilities in daily care. In the cross-sectional study where 199 adults with low vision participated, Guerette and Smedema used questionnaires and visual functioning tests. The questionnaires were used to gather data on the daily tasks that were dependent on vision and the perceived abilities of these adults to care for themselves. Guerette and Smedema indicated that the relation of perceived visual functioning to physical functioning proved a better indicator to the ability of adults to self-care or provide care for others dependent on them than conventional clinical visual tests accepted as a measure of visual disability (Hogan, 2010). The reduced ability to care for oneself is cyclical with a decreased desire to care and brings to the forefront issues of self-neglect.

Depression

Apart from the inability to perform daily tasks adequately, depression is another barrier to the adjustment of adults to living with low vision. To this end, numerous researchers primarily focus on depressive symptoms of low vision, rather than on clinically defined depression. Corn and Erin (2010) demonstrated that the prevalence of depression in adults with low vision was twice as high compared to the numbers found in

the other age groups with low vision. However, there are marked variations in the study findings used in Corn and Erin's measurements of the degree of association between low vision and depression. Stefanone, Lackaff, and Rosen (2011) showed that despite the variability of these study findings, they concurred to some extent – that depression in adults with low vision is persistent with well-documented depressive symptoms in any other segment of the population.

Congdon et al. (2003) demonstrated that prolonged effects of depression and its disabling and debilitative effects on both the psychological and physiological processes become difficult to dispel, despite efforts put to relieve most of the symptoms. Prevention of depression is much more effective than attempts to provide clinical interventions to manage the resultant depression. Moreover, there are instances, although rare, when adults with low vision develop syndromonal depressive disorders. Such patients are 8.1 times more likely to end up with considerably reduced visual functioning (Congdon et al., 2003). Oftentimes, such syndromonal depression causes prolonged disability in visual functioning, despite positive changes in visual acuity (Rees, 2005). Moreover, depression has been intrinsically linked to self-esteem, and thereby has the potential to affect the desire to learn and could have far-reaching implication in rehabilitative measures. This element is considerable when thinking about the future of interventions and the inclusion of educational technology – both general and assistive technology.

In North America, adults recently diagnosed with low vision exhibited depressed moods. This was evidenced by the associated symptoms of low self-esteem, insomnia (lack of sleep) and loss of appetite (DeLeo, 1999). In the extreme cases, symptoms that are more serious were observed, including hallucinations, drug abuse, and paranoia

(DeLeo, 1999). In a psychosocial assessment of vision deterioration and resultant depression, DeLeo (1999) concluded that poor adaptation and adjustment to vision deterioration led to increasingly depressive symptoms (DeLeo et al., 1999). Thus, depression is a barrier that interventions could lesson as adults adjust to late-in-life low vision.

Gosling et al. (2011) examined the relationship between intra- and interpersonal factors and depression. Gosling et al. (2011) found that the two intrapersonal factors of accepting and compensating vision deterioration were much more related to depressive effects than interpersonal factors as well as factors like the implications of vision loss to family members and close friends (Rees, 2005). Still, the act of divorce or generally a loss of a long-time partner, close friend or a family member, and relocation from a home that an individual spent a considerable period, contributed to depression (Congdon et al., 2003). As such, some researchers purposively chose to exclude from their studies such adults, primarily due to the influence these factors could have on the validity of the findings of the studies (Babcock & Williams, 2006).

Underlying personal characteristics and socioeconomic status of adults with late-in-life low vision determines the varying degree and duration of depression. The depression particularly worsens if low vision couples with deterioration in hearing (Kulmala, 2010). Corn and Erin (2010) postulated that it is wrong to assume that depression is an inevitable effect of the aging process. Corn and Erin based their findings on the argument that statistics in United States show that 80% of people with partial visual impairment and 68% of people severely visually impaired fell within the accepted levels of depression. Moreover, depression can potentially go unrecognized; thus, the

absence of any clinical measures to manage depression. Some researchers alluded that depression resulting from low vision contributed to suicide and grievous self-inflicted injuries (DeLeo, 1999). However, such allusions are inconclusive. On the contrary, the allusions could provide a good base for targeting these social ills.

Kulmala (2010) interviewed 52 patients six weeks after diagnosis with low vision and again, six months later. Kulmala endeavored to assess depressive symptoms, personality traits, visual acuity, and both physical and visual functioning of adults diagnosed with late-in-life low vision. The Kumala's (2010) findings indicated that 23.5% of the participating adults showed depressive symptoms that were higher than the acceptable levels. These depressive symptoms persisted for a considerable period, well over the six-month duration of the study. Kumala also indicated that a third of adults participating in the survey who initially showed no depressive symptoms developed symptoms after six months in a repeat survey. Furthermore, adults with high levels of depressive symptoms were much more likely to have difficulties in social interactions. In a similar study, Bell (2010) concluded that depressed adults with late-in-life low vision showed higher loss of control compared to other age groups. Another risk factor for depressive symptoms is basing an individual's self-worth on the quality of the friends the individual keeps (Cambron & Acitelli, 2010). However debilitating depression is to adults with late-in-life low vision, participation in early clinical interventions, counseling, and the use of eye lenses caused a considerable decline in depression, notably 13% (Cambron & Acitelli, 2010). However, Cambron, Acitelli, and Steinberg noted the causes of depression range broadly and are more personal than general.

Anxiety

Anxiety is another barrier to adults with late-in-life low vision adjusting and acclimatizing to the condition. Rees (2005) associated nervousness, an irregular heartbeat, sweating, nausea, and light-headedness as symptoms of anxiety. Feelings of anxiety come as early as when an individual is first diagnosed with low vision. Diagnosis, more often, causes psychological responses, which coupled with assumptions related to low vision, puts emphasis on the importance of counseling by trained health practitioners to prevent or minimize feelings of anxiety (Rees, 2005). In the view point of Rees (2005), health practitioners should endeavor to create an awareness of the condition as early as possible to reduce the initial high level of anxiety following diagnosis and continue doing so in the course of managing the condition.

More pronounced effects of anxiety abound in the cases where an individual adjusting to low vision is the breadwinner in a family in terms of finances, which usually dictates the general direction the family participates in society (Guerette & Smedema, 2011). In such cases, the individual diagnosed with late-in-life low vision could have feelings of withdrawal or feelings of vulnerability, potentially leading to shunning his/her duties. Moreover, as referred to by Bell (2010), feelings of anxiety and a lack of joy account for hindrances in an individual's participation in societal activities, partaking in hobbies, and engaging in economic activities. This lack of joy and increased anxiety could prevent adults with late-in-life low vision from adjusting to and leading normal lives. Inactivity mediates the relationship between acuity of vision and distress levels related to deteriorated vision. As such, levels of distress have a linear relationship to the number of activities an individual relinquishes due to visual deterioration. Eventually,

loss of the ability to carry out valued activities causes a perception of a reduced quality of life for an adult with late-in-life low vision.

Dependency

Dependency forms yet another barrier to adjustment and leading normal lives to adults living with late-in-life low vision. Adults with late-in-life low vision experience the feeling of dependency. This is more so when the environment surrounding them, prevailing negative social attitudes, and fear of inability to manage carrying out daily tasks or personal grooming alone abound (Babcock & Williams, 2006). Adults who generally have experienced independence for a better part of their lives, curtail this feeling of independence when their vision deteriorates. These adults, therefore, will have a tendency to think that their dependence causes a burden to others near and around them, a tendency that bears heavily on their expression of feelings, in the end affecting their mental health (Babcock & Williams, 2006).

Similarly, there are some adults with late-in-life low vision who harbor feelings of guilt and humiliation in their apparent inability to carry out certain core personal tasks, such as grooming, dressing, or eating. They perceive that such dependence invades on their personal privacy. Such perceptions are usually associated with, or prompt feelings of, self-depreciation (Rees, 2005). Furthermore, there is documentary evidence of the presence of some illnesses or disabilities having the potential to mask vision and reduce an individual's independence further. In a personal account by Wright (2010), who was adjusting to glaucoma, he shared reflections of the difficulty of accepting a considerable loss in visual acuity.

Stigma

Stigma also accounts as a possible barrier to the adjustment process of adults with late in life-low-vision. Stigma is the general feeling of disapproval people harbor towards certain illness of ways of behaving may generate anxiety. Ponchillia and Ponchillia (1996) demonstrated four pertinent contributory factors to stigma associated with reduced vision. The factors are visibility of the condition, an extent to which people are aware of the condition, magnitude of the condition's obtrusiveness (noticeable in an unpleasant way), and the perceived focus of the condition (Ponchillia & Ponchillia, 1996).

Adults with late-in-life low vision adjusting to visual deterioration are more difficult to the individual who exhibit adverse reaction to social interactions. For instance, according to Rees (2005), physical appearance at times leads to a reduced acceptance by normal-sighted peers. Wang (2008) completed a study of 58 "young, middle aged, and older" participants and concluded through interviews that issues in social situations were either due to the understanding of the visual loss by others, or because the adult with vision loss could no longer interpret visual cues. There were two possibilities for the relationship; one – readjust the relationship, or two – let the relationship turn sour (Wang, 2008). The change in relationships causes adults with late-in-life low vision to isolate themselves or try to pass as sighted and cover up their conditions.

Stigmatization oftentimes leads to isolation. This is attributed to societal attitudes that focus on visual functioning instead of the disability itself, or physical barriers caused by decreased vision. Still, stereotyped views of the blind and low-vision people may contribute to the potential of feelings of isolation in adults as they adjust to deteriorated vision (Hadley & MacLeod, 2010). Again, negative self-perceptions could be associated with calling a person blind or low vision. This affects the expectations of them and the

treatments by people around them accord them (Baym, 2010). Ignorance and discriminatory attitudes on partially-sighted individuals also contribute to stigmatization of adults with late-in-life low vision. However, the legislation of the Disability Discriminatory Act of 1995 and 2005 is intended to improve attitudes and help the blind and partially-sighted individuals access the necessities of life, including education and equal job opportunities.

Statistics also fuel stigmatization of those born with low vision. Statistical analysis infers fear of losing or having deteriorated vision is a major concern for the general population. This is usually associated with a lack of awareness. Bishop, Amankwatia, and Cates (2008) cited an opinion poll in the United Kingdom (UK) adult population conducted in 2000. According to the opinion poll, 90% of the UK adult population feared loss of sight more than loss of any other of the four senses, and 71% required counseling or therapy if they lost sight (Matti et al., 2011). Systems play a role in the stigmatization of health conditions not easily noticed. Usually, individuals suffering from disabilities that are not easily noticeable, including adults with late-in-life low vision, have to incessantly endeavor to attract attention to their subtle conditions to justify entitlement to support and supplemental services (Taylor, McMinn, Bufford, & Chang, 2010). This affects their self-worth, self-conscious, and pride, further impeding their adjustment to living with reduced vision.

Loneliness

A loss in ability that changes the structure or routine of ones life can cause a feeling of loneliness. Hogan (1998) aptly defined loneliness as an unpleasant experience which an individual encounters in the qualitative and quantitative assessment of their

social network as less than they desired. Loneliness has traditionally been associated with health problems that include depression, substance abuse, somatic problems, and reduced cognitive processes (Hogan, 1998). However, when an individual feels cared for, this feeling easily and emotionally connects them to others; thus, effectively reducing or preventing loneliness.

Numerous researchers have shown inconsistencies in their findings about the relationship between the length of visual deterioration and the extent of loneliness (Rees, 2005). Individuals who are more socially anxious appear to experience intense and frequent phases of loneliness. Similarly, adults with late-in-life low vision appear to feel lonely more often than their normal sighted counterparts (Rees, 2005). Several situations and feelings could lead adults with late-in-life low vision experience feelings of loneliness, for instance, their environment. Guerette and Smedema (2011) investigated 151 London residents using questionnaires and interviews in ascertainment of their circumstances and aspirations. Guerette and Smedema (2011) studied individuals who were active within their neighborhoods, but their activity was undermined when the wider environment did not accord them adequate safety and security. In a separate study, Hogan (2010) found that over 25% of the participants felt insufficiently in touch with other people – statistics that were compounded in adults whose onset of low vision made recognition of faces problematic. This caused feelings of isolation, evidenced by their feelings of vulnerability and reliance on other people for information. If such feelings went unresolved, there were implications on self-esteem, consequently affecting friendship and relationships (Taylor et al, 2010). A study conducted by Alma et al. (2012) sought to examine the factors that affected the participation level of older adults with

visual impairment in accordance with the biopsychosocial model. Alma et al. (2012) examined the personal values effect attached to older adults with visual impairment. Alma et al. (2012) used a sample of 350 people selected from 786 older clients who were newly registered at Royal Dutch Vision in the Netherlands, which is a provider of low-vision rehabilitation. The common criteria for their inclusion was an age of 55 years and above and referral to a provider of low-vision rehabilitation in line with the stipulations on the visually impaired persons' referral to low-vision services (De Boer, Langelaan, Jansonius, & VanRens, 2005). The variables employed by the researchers were sociodemographic characteristics that included educational level based on the International Standard Classification of Education, gender, income, and age, physical health status, social status, and psychological status.

The study by Alma et al. (2012) revealed that elderly persons who suffered visual impairment were burdened by loneliness. Moreover, Alma et al. (2012) argued that self-management training presents the elder with vision loss with resources and skills to handle the emotional, practical, and social consequences of loss of vision, thereby reducing the feeling of loneliness.

The commentary on low vision and isolation, intoned potential isolations results from visual deterioration closely linked to prevailing attitudes within a society rather than to visual degradation. Many adults with low vision experience isolation and the feelings of inability to the participants. For instance, about approximately 60% of the blind and low vision people opt not to go out due to stress associated with traveling alone (Alma et al., 2012). Exclusion could be more pronounced if, for cultural reasons, there is already limited inclusion in the mainstream society.

The concept of participation among the visually impaired including adults with low vision became significant following the World Health Organization's International Classification of Functioning Disability and Health development (Alma et al., 2012). The ICF development defines participation as engagement in situations of life and offers a concrete framework of outcomes of objective disability. Nonetheless, it does not address the subjective perceptions held by people with disabilities.

Studies undertaken in relation to adults without and with any form of disability revealed that participation of the individual adds value to the Quality of life (Levasseur, Desrosiers, & Noreau, 2004; Levasseur, Desrosiers, & Tribble, 2008). In addition, participation is a way through which one experiences social connections with communities and other people (Hamel, et al., 2008). Evidence of connections between participation, lessened risk of functional (Avlund, Lund, Holstein, & Due, 2004) and cognitive decline (Glei, Landau, Goldman, Chuang, Rodriguez, & Weinstein, 2005). Thus, there is a hypothetical relevance between participation and benefits to the adults adjusting to low vision and social networking and connecting with technology.

Taylor et al. (2010) provided considerable detail to explain and demonstrate the value of connective knowledge, in particular, to adults adjusting to lives with low vision. Taylor et al. (2010) assert that there are two major types of conventional knowledge: qualitative and quantitative, originating from historical works of Ancient Greeks and philosophical arguments of the Arabs, respectively. However, distributive knowledge is emerging as a third major category, oftentimes referred to as connective knowledge. In simplicity, if a property of one entity leads or becomes a property of another entity, they become connected. The resultant knowledge is called connective knowledge.

Having described what constitutes low vision and elaborated on the barriers adults with late-in-life low vision encounter in their adjustments to lead normal lives, the remainder of the chapter systematically reviews previous and current studies on the use and value of learning and using technology in the adjustment process. More so, using and managing online forums affect personal, social, and economic connections of these adults.

Traditional Providers of Low Vision

Before initiating a discussion on the present low-vision rehabilitation service providers, it is significant to shed light on the traditional providers that include optometrists, ophthalmologists, rehabilitation teachers, and orientation and mobility specialists (Corn & Erin, 2010). These rehabilitation service providers are proficient, trained, and educated. Orientation and mobility training came into practice nearly 35 years ago, and it is specifically designed for individuals suffering from low vision. The main aim of this training is to mitigate limitation with respect to functional mobility (Corn & Erin, 2010). Mobility instructors assist the individuals with low impairments to restore or build up the self-regulating functional mobility of the individuals experiencing low vision. The term mobility refers to the techniques through which a person can move independently, as well as safely in their society (Pearce et al., 2011). The mobility techniques can be applied by the means of electronic travel aids, dog guides, sighted guides and long canes. Mobility instruction allows an individual to orient to his place of employment, neighborhood, and environment (Pearce et al., 2011).

In addition to mobility skills, individuals experiencing low vision are also taught orientation skills. These skills guide an individual to utilize sensory information to locate

their location in the environment (Bosch, Boonstra, Willemsen, Cremer, & deVries, 2014). When processed, the sensory information assists an individual in determining their location with respect to momentous objects and significant landmarks in their surroundings. The chief concern of orientation is to indentify with the individuals about their location, place they desire to go, and technique that needs to be adopted in order to reach to their desired location (Bosch et al., 2014). Although a mobility specialist is the most appropriate person to teach mobility and orientation instruction, a rehabilitation teacher can also present instructions related to orientation within a home environment. The treatment procedures adopted by rehabilitation teachers to treat visually impaired individuals are based upon the principles of social work, adult education, and adaptive rehabilitation (Boonstra et al., 2012). The primary focus of rehabilitation techniques include areas such as indoor orientation skills, leisure activities, activities involved in daily routine, education and communication, personal management, and home management (Boonstra et al., 2012).

Furthermore, the establishment of training programs with respect to rehabilitation teaching in 1963 had initiated the development of rehabilitation teaching profession. The rehabilitation training programs emphasized upon teaching methodologies and specified learning (Chiang & Keeffe, 2011). In addition, these programs focused upon multiple disability issues, gerontology, indoor orientation skills, communication skills, principles of rehabilitation teaching, and the psychosocial aspects of vision loss, low vision, and eye pathologies. Moreover, the rehabilitation teaching is oriented to multiple goals (Chiang & Keeffe, 2011). Recognizing the significance of small achievements older people attain during the process of rehabilitation is the first goal of rehabilitation teaching. The second

goal of the rehabilitation teaching is to sustain the functional ability of the individuals experiencing low vision (Chung et al., 2012). The last goal is to maintain an active life for the people experiencing low vision and other visual impairments. While dealing with adults, the rehabilitation teachers assist them to sustain the dynamics of their lives (Chung et al., 2012). They facilitate the adults to enhance their ability to effectively adapt to the transformations in their independent lives due to low vision (Bosch et al., 2014).

In the context of problem solving, the rehabilitation trainers evaluate the situations and expectations of individuals with low vision and develop strategies in order to respond to those situations and expectations (Goldstein et al., 2014). Optometrists and ophthalmologists are the two types of specialists associated with low vision. The function of ophthalmologists is to diagnose ocular pathology. In addition, they also acquire the responsibility to develop suitable interventions and present recommendations regarding medical care (Goldstein et al., 2014). On the other hand, optometrists work with the patients to design low-vision devices which aid patients in achieving best performance in their daily tasks.

The services associated with the healing of low vision are generally linked and provided by non-profit, state and federal organizations (Binns et al., 2012). The chief aim of these organizations is to provide adequate services to the individuals who are suffering from low vision or other visual impairments. Traditionally, the blindness system focuses upon the professional rehabilitation of the individuals who are about to lose their employment due to low vision (Binns et al., 2012). However, the blindness system failed to acknowledge the non-vocational goals of elderly people. As a result, the needs of the old-aged people suffering from low vision remained unattended. This issue was further

compounded by the conflicts among agencies for blind person, field of aging, and service providers (Pearce et al., 2011).

It was noted by various researchers that service providers for elderly people were not professionally trained in the areas of low vision. As a result, the elderly people suffering from low vision were referred to agencies for the blind for the treatment (DeVries et al., 2012). However, according to these agencies, the elderly people require many additional services in relation to aging. Therefore, it was suggested by these agencies that individuals belonging to the field of aging could act as the best service providers for the adults experiencing low vision. Despite the fact that current service delivery systems of both types deal with adults experiencing low vision, traditionally the adults with low vision were not their target clients (DeVries et al., 2012).

Another reason that results in the absence of adequate solution to low vision in adults is the perception among the professionals and the older person is that declining vision is the consequence of aging (Alma et al., 2011). In the view point of Levkoff (1982), many physicians fail to realize the difference between actual medical conditions and age-related visual issues. The capabilities and knowledge of the physiatrists have been questioned for the reason that they are the chief care providers for the individuals with low vision but still had overlooked the potential cause of visual disability. This disability is referred as low vision (Alma et al., 2011). According to Wainapel (1995), lack of adequate understanding of the physiatrist regarding the basic principles of visual rehabilitations has challenged their role as a primary care provider. Due to this lack of awareness and understanding regarding the current rehabilitation services available for patients suffering from low vision, many researchers along with Wainapel (1995) argue

that physiatrists do not acquire adequate understanding regarding visual rehabilitation services.

Quality of Life (QOL) with Low Vision

Over the past several decades the quality of life experienced by elderly people with low vision was the topic of discussion of many researchers. This is because there was an abundance of literatures addressing the issue (Awdeh et al., 2010). The majority of these literatures was based upon the research that had utilized a range of quality of life scales to measure quality of life of people suffering from chronic conditions such as low vision. Beside quality of life, social relationships plus psychosocial well-being were the other two issues that have attracted the attention of many researchers (Lamoureux & Pesudovs, 2011).

The two main methods utilized by the researchers to obtain data on quality of life include focus group discussions and questionnaire. According to Slakter and Stur (2005), people with low vision experience impaired capability to perform their routine tasks, and this can adversely influence their quality of life. Moreover, in the viewpoint of both the researchers, rehabilitative services that aid adults in performing their daily routines can enhance the quality of life. In their study, Hassell, Lamoureux, and Pesudovs (2011) had utilized questionnaires to determine the relation between severity of low vision and impact on quality of life. The researchers also embraced the apprehension of the participants regarding the decline in vision and increased levels of anger and depression. In addition, the participants also raised concerns regarding dealing with everyday issues. These apprehensions and anxiety of adults experiencing low vision impact their psychological health condition and lead to emergence of depressive symptoms.

Berdeaux, Nordmann, Colin, and Arounld (2005) in their study have determined the impact of low vision on quality of life. Their finding suggested that low vision among elderly people can lead to handicap, dependency and incapacity. The study assessed the quality of life and visual acuity of the elderly people with vision loss. The researchers affirmed that their findings are allied with the findings of other related researches. They also confirmed that the outcomes of their study were consistent with the anticipated outcomes. Fylan, Morrison-Fokken, and Grunfeld (2005) showed concern regarding the utilization of questionnaire as a tool to determine the impact of functional performance impairment on the quality of life of adults. They argued that not all the questions included in the questionnaire were relevant, plus these questions rarely encompassed all of the psychological and social aspects. Therefore, the researchers opted to conduct focus group discussion in order to explore the factors that influence the quality of life of adults. The focus group discussions assisted the researchers to discover the following themes: information, loss, employment, hassles, confidence, isolation, safety, and independence (Seland et al., 2011).

Psychosocial Well-being

According to a significant number of studies, there are number of factors that influence the psychosocial well-being of an adult (Seland et al., 2011). These factors include acceptance of low vision, feelings and attitudes towards the situation, compensations and adjustments, and depressive symptoms. Among these factors, depressive symptoms are considered as the most impending consequence of the impact of low vision on psychosocial well-being (Rovner et al., 2014). However, literatures show

that a conflict exists among the perceptions of researchers regarding the notion that vision loss and the extent of loss is associated with depression.

According to Horowitz, Reinhardt, and Keenedy (2005), the prevalence of depression cannot be anticipated, even though it is a ubiquitous and persistent dilemma. Therefore, the authors pointed out that the research failed to discover an association among psychosocial well-being and the intensity of low vision. On the other hand, Teitelman and Copolillo (2005) in their study explained that symptoms of depression are evident in the initial stages of adjusting to low vision. Nevertheless, in the majority of cases, the symptoms of depression can be combated by means of medications or therapies (Rovner et al., 2014). A variety of researches converge to a point that individuals who have experienced depression in past are at a greater risk of experiencing depressive symptoms as a consequence of low vision (Rovner et al., 2014). Furthermore, the research carried out by Chang-Quan, Dong, Yue, and Liu (2010) also determined a relationship between low vision and the prevalence of depression. Adjustment to low vision is also a crucial aspect with respect to the prevalence of depression. Adjusting to low vision is a never-ending, as well as a dynamic process.

Horowitz et al. (2005) highlighted that for people with chronic impairments, adjustment is an enduring process. Moreover, Tolman, et al. (2005) discovered that adults with a poor adjustment capability are more vulnerable to depressive symptoms as compared to elderly people who acquire greater adjustment ability. Compensation of low vision and adjustment to low vision are two factors that aid an individual to cope up with the consequences of depression. According to Teitelman and Copolillo (2005), adjustment to low vision can lead to a sense of achievement and satisfaction since the

presence of this quality can help a person to focus and achieve tasks that were previously deemed unachievable. In addition, the literatures addressing low vision also pointed to optimism, hope, faith and acceptance as the crucial aspects that a person needs to cope with low vision (Velázquez, 2010).

Moore and Miller (2003) in their study performed an interview with men experiencing low vision. Their study revealed that the majority of the participants acquired a positive attitude towards low vision since they have accepted their visual condition. The researchers also pointed out that majority of the participants were hopeful regarding the success of their treatment procedure. Additionally, Moore and Miller (2003) analyzed the perceptions of women regarding low vision. Their study found that women who accepted their low vision acquired a positive attitude towards their treatment. Teitleman and Copolillo (2005) in their study found that adjustment to low vision develops a sense of satisfaction and faith and restores the peace of mind of the individuals.

Social Relationships

A significant number of researchers and practitioners have pointed out that low vision among adults adversely impacts their social interactions and social relationships. Adults suffering from low vision often experience difficulties in face recognition (Rovner et al., 2014). As a result, their social interactions are negatively impacted. It has been frequently noted that in order to prevent feelings of embarrassment, adults suffering from low vision withdraw themselves from gatherings of large people (Awdeh et al., 2010).

Horowitz et al. (2003) carried out a research to determine the impact of low vision on the circumference of the social sphere of an individual experiencing low vision. Their

study found that with the passage of time, the size of the circle of family and friends of the individual experiencing low vision becomes contracted. By the emergence of this finding, the hypothesis of the researchers was rejected. However, various researchers have pointed out that involvement of adults with low vision in rehabilitation services leads to the retention of large group of friends and establishments of new friendships (Seland et al., 2011).

Wang (2008) conducted a study to analyze the challenges associated with relationships confronted by the adults experiencing low vision. In addition, the study also proposed strategies that can be utilized by adults to effectively cope with these challenges. The researcher found two potential challenges. The first challenge was raised due to lack of visual cues, while the second challenge emerged due to lack of understanding of friends and family members. In order to cope with these challenges, the affected people needed to readjust their own behavior or depend on other senses for sustaining social interaction (Seland et al., 2011).

Effects of Low Vision on Activities of Daily Living

Elderly people suffering from low vision are often flanked between a dependent and independent state in relation with their performance of routine tasks (Finger, et al., 2011). An elderly person not associated with any institution and suffering from low vision confronts emotional, as well as physical barriers that influence his daily tasks. In recent times, many studies discussing low vision have highlighted that an adult suffering from low vision experiences an increase in complications with respect to his daily tasks (Finger et al., 2011). The presence of low vision in a non-institutionalized adult leads to

complications in performing routine activities, such as walking in the community and home (Schinzel, et al., 2014).

Individuals experience low vision as a consequence of an existing disability, or it can also be experienced independent of any medical health condition. Regardless,, low vision can adversely impact the routine life or functional abilities of a person (Schinzel et al., 2014). When a person ages, he confronts additional barriers that endeavor to diminish his self-sufficiency. Besides low vision, other conditions that lead to reduced mobility and consequently to increased dependency include physical infirmities, living unaided subsequent to the demise of a spouse, forced financial circumstances, reduced strength, and hearing impairments (DeVries et al., 2012). These factors, when combined with visual impairments, lead to devastating impacts on the independence of a person. According to present researches, low vision experienced late in life leads to reduced travelling, constrains physical activities, disrupts social interactions, and limits the independent mobility of a person (DeVries et al., 2012). It has been noted often that whenever an independent adult experiences low vision, it will result in is a decreased sense of self-worth and self-competency, particularly when the independency transforms into dependency.

Various issues associated with daily activities confronted by adults experiencing low vision include difficulties in paying household bills, inability to read package directions, difficulty in preparing meals, difficulties in using a telephone, accidentally burning themselves on a stove, and inability to differentiate between spoiled food and non-spoiled food (Lamoureux & Pesudovs, 2011). In addition, the adults suffering from

low vision due to their conditions are forced to exert more pressure in expansion of mental and physical energy.

Adults with low vision often face difficulties while reading printed materials because such materials requisite near distance reading ability (Lamoureux & Pesudovs, 2011). Majority of the books, newspapers or magazines emboss printed material that utilizes low-contrast format and small print size. As a result, adults with low vision confront difficulties while discerning the embossed material. Moreover, visual impairments such as low vision can make the environmental condition of lightning abnormally low (Awdeh et al., 2010).

Connective Knowledge and Connectivism

Knowledge encompasses the information, understanding, and skills that an individual gains through either education, experience, or both. Conventionally, knowledge was categorized in two major types: qualitative and quantitative (Downes, 2007). Qualitative knowledge originated from major schools of history, especially from the works of ancient Greeks. On the other hand, quantitative knowledge originated from philosophical works in the Arab world, and much later from Renaissance philosophy. These two categories of knowledge were collectively termed as probabilistic knowledge (Downes, 2007). However, Downes (2007) argues there is a third major category of knowledge that is increasingly gaining acceptance, evidenced by various research works and debates to include it in education systems owed to the numerous benefits it promises. This third category of knowledge is referred to as distributive knowledge and at times described as connective knowledge.

Connective knowledge greatly differs from probabilistic knowledge. While probabilistic knowledge is typically about the existence of a relation between one entity and another; connective knowledge goes further than the existence of a relationship – it implies interaction. Connective knowledge is knowledge of the connection (Downes, 2007). For instance, if I told Mary to vote in a certain way, and she does so, an interaction has taken place, and a connection has been established; that is connective knowledge.

Further, according to Siemens (2004), connective knowledge defines learning from the perspective of digital age. Connective knowledge helps explain the Connectivism Theory. Connectivism Theory as postulated by Siemens (2004) is a learning theory based on the idea that learning usually occurs through interactions (connections) between learners, educators, and learning instructions or materials. From this idea, Siemens (2004) and Downes (2007) came up with the Connectivity Theory to explain learning in today's complex learning system, at the same time factoring in the rapid technological advancements in the field of digital social networking.

Connectivism Theory further helps model learning in a digital age by using technology to network individuals, provide them with information, knowledge, and skills that are valuable to their day-to-day lives as well as in their professional lives. This model departs from the traditional model of classroom learning where the provision of knowledge and information extensively relied on the educator's ability and expertise (Siemens, 2014). The theory gives educators an opportunity to exploit these networks and factor them in their teaching methods, such that, they become a dominant node on the network and interaction of connective knowledge (Boyd & Ellison, 2007). Dunaway

(2011) fronts this argument citing that learning increasingly occurs across several technologies that are outside the traditional classroom.

Thus, learners, teachers, and facilitators can share knowledge through connections and with connections. Additionally, the very significant impact that information technology has had on learning contexts demands for the development of a new theory (Siemens, 2004). Besides, the already established theories portray learning as taking place within an individual, which translates to brain-based learning (Dunaway, 2011). Evidently, such theories fail to recognize the fact that it is possible to conceptualize learning, meaning, and knowledge in the form of networked elements that are existent outside the human being (Dunaway, 2011). Thus, a connectivist approach contends that learning theories that are already established fail to appreciate that information and communication technologies influence human cognition significantly (Dunaway, 2011).

Unlike other theories related to education like the constructivist learning theory, the Connectivism Theory emerged its way into the information technology revolutions that brought the proliferation of the Internet (Siemens, 2004). Learning theories like Connectivism and others seek to offer descriptions about the learning processes and give a significant model for instructional design in the contexts of information literacy education (Dunaway, 2011). Furthermore, learning theories can assist educators in developing learning environments that make it possible for students to gain the most out of instructional experiences (Grassian & Kaplowitz, 2009). On the other hand, learning theories connect the observed changes in relation to performance with what is perceived to cause such changes. Various reason in this section present why Connectivism is a suitable theory for investigation of the research of interest in this paper.

In line with Connectivism, Dunaway (2011) argued that the concept of learning happens across information technologies and networked learning communities are fundamental to Connectivism. Indeed, Siemens (2004) and Dunaway (2011) consent that Connectivism stresses on the significance of networked information resources across the entire learning processes. Moreover, Connectivism acknowledges the role that information technology plays in the retrieval of information from numerous sources and skills' development for the assessment of connections between various sources of information in an information network that is dynamic (Dunaway, 2011).

It has been demonstrated by Rees (2010) that adults experiencing depression in their adjustment process require creating and maintaining personal and social connections with close family members, friends, and counterparts, to lessen their depressions. Accordingly, the Connectivism Theory provides facilitation to adults with low vision to create and maintain connections with one another using online social media. Although this theory is applicable to all people learning presently, it could be customized to be helpful to adults adjusting to living with low vision.

According to the Connectivism Theory, an in-depth understanding of the application of technology to social interactions of individuals with low vision late-in-life could make a huge difference between the initial feelings, connections, and adaptations of these individuals prior to their condition of low vision – when they were fully sighted – and when they progressively developed low vision. This understanding would also play a key role in lessening their phases of depression as they begin to adjust to a life with low vision (Siemens, 2004). To this end, according to one of the principles of the Connectivism Theory, learning is like nurturing, where maintaining connections is

pivotal to facilitate continual learning, filling possible gaps, and breaking down possible barriers encountered by adults adjusting to a life with low vision and their continued participation in social networking (Siemens, 2004).

Connective knowledge is critical in explaining the personal and social connections made by adults adjusting to living with late-in-life low vision. Again, connective knowledge occupies a central place in the use of technology, in particular, online forums, to create and maintain connections by adults with late-in-life low vision. It explains the interactions between individuals and entities in online forums, as well as in physical meetings and physical forums, shared by adults with low vision, their family members, and the professionals aiding them (Tschofen & Mackness, 2012). In his theory of scale-free networks, Barabasi (2003) further advances the idea of connective knowledge. The theory of scale free networks proposes that "… the structure of many networks is fundamentally defined by the power law effect, whereby most contact points (nodes) have very few links held together by highly connected hubs of activity" (Barabasi, 2003, p. 294). In essence, this theory indicates that any movement from disorder to order is managed by powerful forces of self-organization, paved by power laws.

Barabasi (2003) defined the role of a node in any network. A node as a person in a community, links as friendships, and hubs as highly connected nodes (people). As such, in a random network, human beings may have a predictable number of friendships, or a predictable degree of friendships. However, in a scale free network, not a single dominant human, exists and the friendship follows the power law, that is, some humans may have a thousand friends, while a thousand humans may have a few friends. Finally, he denotes

fitness of a human as the ability of the human to outpace other humans in a network in any given area of personal, professional, or social life.

Based on the scale free theory, health care professionals working with educators could devise ways to ensure adults with late-in-life low vision establish and maintain connections in a network such as online forums and meetings (Barabasi, 2003). Such connections will equip them with the necessary knowledge and shared experiences, which eventually will be instrumental in their adjustment process; thereby allowing them to lead normal lives.

Critique of Connectivism as a Learning Theory

In the view point of Downes (2007), the concept of Connectivism indicates that knowledge is distributed over different networks, and therefore, learning signifies the capability to traverse and construct those networks. On the other hand, Siemens (2004) pointed out that learners retrieve their proficiencies from various connections. In addition, Siemens (2004) argued that learning structures are not hierarchical or leveled, and learning systems empower the ability to differentiate components that need to be chosen based upon a specific research or learning movement.

When viewed in the light of Siemens (2004) and Downes (2007), Connectivism appears to be an instructional theory which presents specificity to instruction in a given learning context, instead of limiting the boundaries of learning theory to general principles. As indicated by Morrison, Ross, Kemp, and Kalman (2011), learning theories ought to be broad and eloquent, whereas instructional theories out to be situation specific and narrow. The Connectivism theory assumes that knowledge, information, and

individuals do not operate separately but are linked to each other. Therefore, the framework requires both learning networks and learners simultaneously.

This notion gives rise to two questions: (1) In what manner did the pre-connection knowledge expanded to establish learning networks, and (2) Who was the first one to emerge learners or learning networks? Indeed, Siemens (2005) does recognize that learning and information can exist separate from people, in the antiques and groups wherein their interactivity is fostered. Logically speaking, Connectivism theory must not be considered as a learning theory for the reason that it lacks the capacity to describe the constituents of learning that are explained exclusively (Hilgard, 1958). Conversely, education in the 21st century needs theories designed for 21st century learning (Garrison, 2011).

An essential component of a learning theory is that it endeavors to be widespread, not fractional. Maddock and Fulton (1998) affirm that, "If a theory can't clarify all features of human conduct, then it can't clarify any" (p. 9). Calvani (2008) pointed out the absence of innovation in connectivist ideas and alluded to different scholars who did pioneer the plans which are sewn together in distinctive approaches to enrich the Connectivism system. On the whole, Connectivism theory appears to be standing on a single foot.

Connective Knowledge and Social Networks.

Siemens (2008) carried out a comprehensive study, exploring the shifting role of educators in networked learning in order to assist learners form diverse personal learning networks, thus equipping them with in-depth knowledge of complex fields. In the study, Siemens (2008) was quick to note that technological developments coupled with social

software that increasingly expands social networking sites and the numbers of forums in these networks significantly alters how learners access information and knowledge, and how learners interact with educators and peers. He goes on to suggest that the Internet is increasingly occupying a central place in the provision of opportunities for the learner to create, to dialogue and to disseminate information. In essence, Siemens (2008) was referring to connective knowledge.

The networked lifelong learner concept flourished in the context of personal knowledge management studies with literature connecting competencies of learning-to-learn with technologies with the concept (Cigognini, Pettenati, & Edirisingha, 2010). Such literature points out the different skills that are necessary as multifaceted ability sets, according to Martin and Grudziecki (2006). Among these skills are information literacy, digital literacy, and the capability to use social software effectively in the development of one's own environment of learning (Martin, 2008). The knowing knowledge attitudes aspect of relational and social interactivity described in Siemens' (2004, 2006) framework pinpoints that the mastery of technology is among the many requite skills needed for continued participation.

Therefore, connective knowledge as entailed in social networking forums could be much more beneficial to adults with late-in-life low vision in acquiring information and knowledge regarding their condition, than the use of the traditional learning process, where the educators imparted both information and knowledge (Bell, 2010). Because of the variability of sources of information characteristic of connective knowledge, this gives much detailed information, including real life experiences that are instrumental in

ensuring adults diagnosed with low vision accept their condition and adjust accordingly; hence, lead normal lives.

The study by Siemens (2008) suggested that the popularization of the Internet as a medium for commerce, information sharing, communication, and education, has considerably raised the profile of networks as a means for human organization. Further, the study claimed that the development of today's participative web added a practical framework to both communication and content creation opportunities of networks. Although the study raised concerns of authority and trust, the Internet is increasingly being used for communication and collaborative purposes. Online tools such as blogs, social bookmarking, YouTube, and virtual worlds have the potential of ensuring that individuals maintain communications with friends or collaborate on a project or issues (Siemens, 2008).

Considering the suggestions and claims of the Siemens' (2008) study, it becomes clear that the Internet plays a pivotal role in sharing and dissemination of information. This could be true more than any other available media. As such, the use of Internet tools, such as social networking sites, that link adults with low-vision peers who share personal experiences, as well as existing clinical interventions, are methods an individual could use to prevent or minimize phases of depression due to low vision (Siemens, 2008). This sharing of information could aid these adults in adjusting to the condition, and perhaps, lead normal lives.

Nevertheless, Calvani, Fini, and Ranieri (2009) contended that it is also important to refer to the human-computer interaction and usability aspects in relation to handling the technologies. It is important that such tools are easy to use (Calvani, Cartelli, Fini, &

Ranieri, 2008). This assists in avoiding cognitive overload, which can be distracting to the learner. It is often essential to study the features of a tool before its utilization; however, the requirement to learn about the actual tool can interfere with the ease and use of the social networking. Calvani et al. (2009) argued that although not always adhered to, usability rules remain valid for websites. This signifies that even though the rules are not limited to usability, they are constant for websites.

The Value of Web 2.0 Tools (3D projects, blogging) and Social Networking Sites to the Adjustment Process. A meta-analysis was conducted between the years 1990 and 2000 by Resnikoff & Foster (2010), in which they investigated the impact of low vision on self-reported quality of life and changes made after clinical interventions on low-vision. In the review, Rees (2005) noted that it is becoming increasingly commonplace for adults with late-in-life low vision to develop distress and depression. As such, it became needful to determine the effectiveness of current low-vision rehabilitative measures on meeting the needs of adults with low vision.

Acknowledging that depression is one of the single most debilitating barriers to the adjustment process for adults with late-in-life low vision in conjunction with the understanding that an individual maintaining social ties with close family members and friends could effectively alleviate some of the depression (Rees, 2005). It becomes important that adults with low vision initiate and maintain personal and social connections to make them feel accepted. Thus, social ties, including online connections, could effectively alleviate the circumstances or grounds that might lead to depression. Technology, in particular, online forums, could provide the infrastructure for such connections (Rees, 2005).

Learning and sharing information through online forums is beneficial to adults with low vision because it eliminates the need to venture out of their familiar territory to hold physical forums with group members or attend group counseling. One of the causes of depression and anxiety is venturing out of a familiar environment. Without having to do this, adults can adjust smoothly to lives with deteriorated vision (Senra, Oliveira, Leal, & Vieiva, 2011).

Web 2.0 tools and features provide users with the opportunity to collaborate, connect, and communicate across a myriad of technologies and tools. A unique feature of the later age web is the creation of collaborative information. Web 2.0 tools give end-users the opportunities to develop information and therefore, knowledge, according to Comorode and Krishnamurthy (2008). The widespread use and explosive development of the technologies based on the Web 2.0 tools have sparked debates about how effective traditional paradigms of learning are (Hicks & Grarber, 2010). Greenhow, Robelia, and Hughes (2009) summed that the learning ecology concept conceptualizes how learning happens across a contexts set available in the virtual or physical spaces that offer learning opportunities. Clearly, the emphasis that Web 2.0 tools place on connection, content creation, and communication has added to the interest of the educators in a manner in which web technologies interact with the learning process of individuals (Dunaway, 2011). These fresh learning contexts in a digital age and the use of Web 2.0 tools for interaction, connection, and communication encompass the use by adults adjusting to low vision.

Marcum (2002) stated that computers networked in conjunction with the web offer numerous complexities since communication mediated by computers is interactive

and links many-to-many. One example of these interactive links to information is Wikipedia. Boutang (2010) argued that the Wikipedia phenomenon and its collaborative function raise questions to the vertical authority of education and knowledge. The previously established theories rely on a vertical authority due to little emphasis on digital collaboration. Such conceptions have compelled scholars to alter the standard information definitions and come up with new frameworks for the conceptualization of information and instructional design (Dunaway, 2011). Head and Eisenberg (2010) stipulated that more students frequently use Wikipedia for research related to course content as a pre-search tool. Thus, Wikipedia and its collaborative, community, may be significant learning networks for student of all abilities and ages to further connections and follow links to other forms of information.

Karagiannidis, Efraimidou, and Koumpis (2010) explored the support of social networking towards collaborative interactions by utilizing a proposed framework for teachers in special education. The framework described a foundation for building an online community of practice using social networking sites to develop a solution to a given problem. The authors described social networking as the process individuals could use to expand their current knowledge by making connections with individuals of similar interests. Social networking sites include Facebook, MySpace, and LinkedIn, where an individual initially creates a personal profile, then creates connections to individuals they know, then communicates and shares interests and preferences with the individuals. This form of information gathering offers adults with low vision an opportunity to generate their own content and interact with myriad perceptions presented by others, thereby enhancing their active participation. This is in line with an approach by Seale (2010)

whereby content that is user-generated carries with it the opportunity to encounter multiple voices and perspectives. Sites like Yammer and again LinkedIn may present a multiple voice that is different from the presentation on Facebook and MySpace.

The study further discussed social networking in three main elements that interact and function together, creating an ideal knowledge structure that is responsible for developing and sharing knowledge. These three elements are: domain, community, and practice. The first social networking element, domain, as discussed by Karagiannidis et al. (2010), refers to a common ground used by participants to share ideas, knowledge, and experiences. As identified by Murrell (2001), cited in Karagiannidis et al. (2010), collective imagination and discourse about individuals' feelings form resources that are pivotal in the generation of constructive change and/or improvement. The study went on to suggest that as individuals in a domain engage each other, they develop a shared understanding, such that, a domain presents a foundation that supports personal meaning and strategic relevance.

On the other hand, community, the second social networking element, refers to a group of individuals learning and interacting together and building relationships. As such, the group builds a sense of belonging and mutual commitment, creating strong structures and tools that will be useful in their anticipation of the future (Walter et al., 2007). The use of social networking tools such as Facebook and Twitter effectively builds community through dialogue and conversation, sharing both past and present experiences (Karagiannidis et al., 2010).

The third element, practice, refers to the specific knowledge the community may develop, share, and maintain. When individuals on a group collaborate using social

networking tools, they reveal their cultural values or, better still, reflect on the creation of novel cultural norms and conventions (Downes, 2007). Social networking tools are more than just tools that mediate communication among group members; they have the potential to alter the groups' way of thinking and approaching a task (Cambron & Acitelli, 2010). In other words, social networking tools change how an individual thinks, learns, and interacts with other individuals.

The study by Karagiannidis et al. (2010) concluded that domain is the topic the community discusses, while the practice is the specific knowledge the community develops, shares, and owns. If put in the context of adults adjusting to a life with low vision, these three elements, in combination, could simplify their adjustments and make them lead lives free of depression. This is attributed to the fact that social networking tools have the ability to alter the perception of these adults in the way they think, learn, and approach tasks, as well as create new cultural norms and conventions. In addition, by giving these adults personal meaning and strategic relevance, they will be able to confidently face their inabilities and emerge as stronger and more confident individuals than they were before using the social networking tools to interact.

In an autoethnographical study, Ryan, Margo, and Sharp (2011) explored educational and cultural adaptation through social networking sites. The study focused solely on Facebook as a social networking tool. In particular, they investigated how Facebook could aid education and cultural adaptation processes. They began by giving empirical support as to why social networking is gaining importance as a source of information, sharing of information, and a source of knowledge. The purpose of the study was based upon three major themes:

- How Facebook may serve to increase self-efficacy (an individual's belief of his/her ability to succeed at a given task) and self-regulation (how an individual can monitor his/her learning).
- The level of self-disclosure among faculty members using Facebook and its impact on students
- How students' personality influences their perceptions, adoption, and use of Facebook

The study adopted a qualitative methodology on a target population of first semester doctoral students and their adaptation to a Ph.D. program and a new national culture. Although at the time of this study, there was a scarcity of literature that examined the use of social media in educational and cultural adaptation processes, the study made considerable contributions to this literature. The study indicated that Facebook had over 500 million active registered users worldwide, and its active growth between the years of 2008 and 2009 was calculated at 105 percent. Social networking sites such as Facebook considerably aided in adaptation because social networking sites facilitate knowledge exchange, help alleviate apprehension, and enable enhanced socialization and community building. In their recommendation, they suggested five factors necessary to include social networking sites in aiding education and cultural adaptation (Ryan, Margo, & Sharp, 2011). These were:

1. Facebook should be established with a course related identity
2. All users have to be sensitized on security and privacy issues
3. Provide tips to include various types of knowledge exchange
4. Encourage wider participation

5. Assess the system and adjust accordingly.

The adaptations suggested by Ryan, Margo, and Sharp can be applied to intervention that specifically address the general technology education of adults with low vision. From the study findings and recommendations of Ryan, Margo, and Sharp (2011), it emerged that the prevalent use of networking sites cannot go unnoticed in matters of dissemination and requisition of knowledge. Although these findings target educational institutions, they are nevertheless useful to adults who are adjusting to living with low vision.

Their use of social networking sites, as demonstrated by the study findings, will facilitate their exchange of knowledge, alleviate their apprehension, and make them bond faster. Ultimately, use of networking sites will enable enhanced social skills and thus help build stronger communities. Altogether, these findings indicate that the use of social networking sites will be instrumental in fostering their acceptance of one another, easily adapt to their condition, and assist one another face the condition as well as any future anticipation due to low vision.

Christakis and Fowler (2009) emphasized the importance of social networking sites in creating personalities and personal identities. The duo aptly summarized their work in the title, “Connected – How Your Friends’ Friends’ Friends Affect Everything You Feel, Think and Do”. They likened social networking sites to a school of fish, which change direction in unison, implying that the people around an individual lead the individual unconsciously.

The findings of both the researchers suggested that the network an individual keeps shapes the individual. Individuals usually belong to some social networks that have

properties and functions not actively controlled by the participating individuals. These networks create cultures more complex than the individuals within them realize, and with time, the culture influences the networked members. This is because human beings are ultra-social creatures whose brains are influenced by the networks an individual keeps. Furthermore, the networks kept by individual are smart.

Social networks have a combined intelligence greater than that of each of their members, such that, the intelligence usually complements individual intelligence. Moreover, an individual's happiness is contagious. The emotions and behaviors of individuals in a network greatly influence the behaviors and emotions of individuals in a network. Not only do those close to you influence you, but also, those close to those close to you may influence you. Christakis and Fowler (2009) argue that an individual is 15% more likely to be happy if directly interacting (connecting) with a happier person. This likeliness is 10% likely also to a friend of a friend, and 6% likely to a friend of a friend of a friend. Happiness to the duo is contagious (Christakis & Fowler, 2009). In addition, the network an individual keeps supports change. For instance, in tackling social concerns like crime, substance abuse or public health, it is more prudent to address groups of people than to address an individual, because it is easier for a network to change an individual than for an individual to change a network. Lastly, an individual's action matters. Human connections are ubiquitous, implying that social networks an individual keeps affect the individual; likewise, the converse is true. Each individual has a much bigger influence on others than imagined.

Christakis and Fowler's (2009) findings indicated that the value of social networking sites on individuals is significant. Similarly, in the case of adults with late-in-

life low vision, their findings are of significant values. By actively participating in a social networking site, an adult with low vision could be shaped to view life more positively, as does the network, instead of always being pessimistic and depressive. Similarly, such social networks add on to the intelligence of an adult with low vision, making the adult wiser in dealing with past and present conditions that initially seemed depressive. Still, by subscribing to a social network, adults with low vision could change to reflect on the groups' positive attitudes and cultures, greatly influencing his view of life, thereby making easier the adult's adjusting process to a life with reduced vision.

Technological, Ethical, and Security Issues in Social Networking Sites. Educators and healthcare practitioners, responsible to ensure that adults with low vision adjust smoothly to lives with reduced vision and lead normal lives, should be considerate of the levels of exposure and the use of online technologies by adults. Adults with peripheral knowledge and adults with exceptional knowledge possibly require some assistance, and all of the adults gain from the experience and use of online social media. This is against the backdrop that adults with low vision have a desire to belong to social networks to enable them interact and share ideas and experiences with other adults affected by low vision (Karagiannidis, Efraimidou, and Koumpis, 2010).

In addition to the technological issues that might hinder the utilization of social networking sites to its fullest potential, ethical and security (privacy) issues must also be considered when using social media. Gosling et al. (2011) highlighted some of the ethical and security issues associated with the utilization of social media. Firstly, the excessive utilization of social media leads to the exploitation of personal information. The utilization of social media can interrupt and put at risk the privacy of an individual.

Individuals usually risk trading privacy with convenience. For example, individuals do not always read all the disclaimers prior to accepting to use or download something online.. Furthermore, it is often noted that the majority of users do not recognize their privacy rights and therefore become the victims of online spies. These individuals lack an adequate understanding of how personal information should be exploited on social networking websites. The use of social media leaves traceable records on the personality of the individuals. It has been evident from various experiences that any personal information placed on social networking site is potentially at risk if not privatized.

Digital Exclusion versus Inclusion of Adults with Low Vision. In spite of the promising future of social interaction and collaboration that social networking has for adults with low vision, a risk of digital exclusion exists (Gallagher, Murphy, & Fennel, 2012). A study by Gallagher et al. (2012) related to digital inclusion and aging in Northern Ireland revealed that an estimated eighty percent of the entire population with any form of visual impairments are aged sixty-five and above (Tate et al., 2005). This brings about the significance of age as a demographic variable in this study. Additionally, Charles (2007) stated that women in the cohort stipulated by Tate et al. (2005) outnumber men by a ratio that is close to three to one.

On the other hand, Gallagher et al. (2012) state that it is critical to comprehend the magnitude of awareness of information technology opportunities and benefits among older adults. Similarly, it is equally important to pinpoint the needs of older adults about accessing information technology and obtaining computer literacy (Gallagher et al., 2012). According to Gallagher et al. (2012), there have been advancements on the European Union and the Northern Irish government policies geared towards the

integration of mainstreaming and inclusion principles. Nonetheless, numerous cases indicate that they are still far from full implementation of such policies and the complete realization of their aims (Gallagher et al., 2012).

According to Gallagher et al. (2012), computer literacy is currently almost as fundamental as any ordinary numeracy and literacy skills. Furthermore, due to the rapid advances in the information and communication technology fields, there is increased risk of excluding older adults and leaving behind people with different forms of disability (Gallagher et al., 2012), including visual impairment. The European Disability Forum (2005) states that a report in 2000 cautioned with the absence of basic rules of accessibility: there is a risk that the revolution of information will lead to a new hindrance that is more disabling. Such a hindrance will hinder the full contribution and integration to society, according to the European Disability Forum (2005).

Gallagher et al. (2012) observed that in a manner similar to communities consisting of older people, the adults who are aging and experiencing loss of vision might be less willing to participate in information and communications technology (ICT). Particularly, this is the case for people who experience loss of or decline in vision and lack the knowledge concerning how assistive technology like software packages for magnification and screen readers may assist them (Gallagher et al., 2012). However, ICT can be used to help people who belong to social groups that are vulnerable and within social contexts that are marginalized, especially order adults in maintaining their active participation in working and social life (Gallagher et al., 2012).

As earlier stated, social isolation affects people with low vision (Caul, 2003; Sloan, Ostermann, Brown, & Lee, 2005), in the same manner as loneliness does (Hinds,

Sinclair, Park, Suttie, Paterson, & Macdonald, 2003). With the growing number of aging populations in the United States and globally, technological assistance in the form of mainstream and specialized assistive technologies play significant roles in the maintenance of independence and promotion of social inclusion (Gallagher et al., 2012).

Gallagher et al. (2012) observed that people who are older have an increasing interest in actively participating in social and work life today. Consequently, in meeting this need, aged and aging people need to be encouraged to engage in lifelong learning, according to Gallagher et al. (2012). The use of information communication technology is employable in helping to provide the aging group with paths through which they can enhance their competencies and knowledge. Gallagher et al. (2012) add that participation in the online social networks is becoming increasingly common and the lack of ability to participate can result in social exclusion.

In relation to digital inclusion and older adults, Gallagher et al. (2012) outline four National Center for Biotechnology Information (NCBI) projects. However, they acknowledge that a good fraction of the projects undertaken by NCBI within the last decade relate to the identification and response to the older adults needs. Gallagher et al. (2012) argue that it is essential to equip adults with the requisite skills and tools for them to handle the emergence of technologies. Nonetheless, the older population is rarely well conversant with such skills, while the people encountering vision impairment are greatly disadvantaged (Gallagher et al., 2012).

Equal Access to Technology Training (EATT) is a project aimed at increasing computer literacy among older persons with visual impairments, according to Gallagher et al. (2012). The lack of awareness and knowledge by older people considerably limits

them from accessing widespread and inexpensive tools of information and communication like the Internet and e-mail services (EATT Project Consortium, 2003). Moreover, people who have completed school ahead of the informational technology age and its incorporation in the curriculum have had to learn from other means, self-teach, or are resultantly unable to access technology. As a result, this places them under restrictions on actively participating in economic, social, and cultural life (Gallagher et al., 2012). The struggle for individuals with visual impairment or low vision to use computers is "they cannot see images" clearly (Crow, 2008, p. 52). Depending on the type of low vision, the light, colors or the combination of both can result in the distortion of images.

Equal Access to Technology Training (EATT) involved research in five countries to explore the needs of older adults with vision loss regarding accessing information technology (IT) training and IT in general. The project advanced the understanding of information communication technology (ICT) use by older persons who live with visual impairment. Still, the project addressed all forms of visual impairment without narrowing down on a specific type of visual impairment.

The Evision 55+ project addressed the aging population and the complementary increase in the population with acquired loss of vision. Evision 55+ aimed at facilitating and encouraging adults over the age of 55 with loss of sight to raise the level of their participation in life and social opportunities through the development and provision of online learning modules that were specifically structured to meet their needs. The project was funded under the European Commission Life Long Learning Programme and concluded on December 31, 2009.

Additionally, NCBI is still undertaking two more projects in relation to the digital inclusion of older people with visual impairments. These include the EU-funded VICON and the I2Web project run by NCBI in conjunction with a conglomerate of user organizations and researchers from Europe to assess how accessible the Web 2.0 applications for older and disabled people are. Although they are yet to be completed, these projects signify the need for people with low vision and vision loss to participate through ICT-based networking platforms especially social networking. However, none of the projects examines the benefits that such collaborations and interactions would bring adults with low vision specifically and especially in the context and scope of the United States.

Low Vision Devices

The advancements in technology had led to the emergence of various assistive devices that help the individuals with low vision in their routine activities (Velazquez, 2010). The low vision assistive devices can be classified into three: magnification strategies, optical devices, and non-optical assistive devices (Velazquez, 2010). The non-optical assistive devices are especially designed to enhance the functional capability of the user. This is achieved by either enhancing the magnifying size or contrast of the object (Dakopoulos & Bourbakis, 2010). Non-optical assistive devices are simple, and they generally include talking watches, large-button phones, reading stands, writing guides, large print, felt-tip pens, and bold line paper. Magnification strategies and optical devices are generally utilized in the rehabilitation services provided to the individuals experiencing low vision (Ganesh, Sethi, Srivastav, Chaudhary, & Arora, 2013). Magnification strategies are specifically designed with the aim to balance poor visual

acuity. The utilization of these devices can enhance the participation of low vision people and also sustain their employments (DeCarlo et al., 2012).

Educational Technologies

The 21st Century has sparked change or the ideal of change in the education system. This century has incited books and articles about the necessities of technology skills, especially in mainstream education, but it is just as important for all individuals young and old, regardless of abilities. A historical goal of education has been the ability for people to "contribute to society, develop personal talents, civic responsibility, and carry traditions and values forward" (Trilling, 2009, pp. 13-14). The idea of intervention strategies and educational training to learn both assistive and general technologies can encompass the same goals. The goal for individuals of any age and ability will be able to continue to participate and contribute to their lives, communities, and society.

The study presented by Popivker et al. (2010) described goals of middle-aged adults with onset low vision and adults without low vision and found many of their goals remained similar to that of the goals of most individuals. However, life goals were not the same and some were dependent on the stage and age of onset low vision. Most goals did lean towards vision-dependent goals and related to quality of life. However, many goals were similar such that adult participation continued in career, education, and financial situations. The Popivker study acknowledged the need for goals in the rehabilitation process, but did not address strategies to promote those goals.

Assistive Technologies

The focus of this dissertation proposal is to understand the possibilities of technology education for adults with low vision as a means to continue to participate and

communicate. However, low vision within itself constitutes the recognition that some assistive technology education is also important to adjustment. Assistive technology helps the visually impaired with routine activities. Adults with low vision can use this technology to access the general curriculum, or general information, and as an aid in the completion of the difficult tasks, in addition to engrossing new material (Copolillo & Teitelman, 2005). However, much like learning to use general technologies available to the population as a whole, assistive technology training and use is also confronted with barriers. Similar to all technology, a major barrier is cost. General technologies can be costly, and so can assistive technology.There are assistive technologies that are needed to use the general technology. These assistive technologies need to be supported to be beneficial in the adjustment process.

In contrast to general technology, the majority of assistive technology cannot be easily accessed. Not only is the equipment difficult to access, but there is also an acute scarcity of funding for devices (Tanis et al., 2012). In addition to difficulty in securing some assistive technologies, a lack of awareness of family members and adults adjusting to low vision is also pervasive. Thus, educational technology during intervention and through rehabilitation can at minimal introduce technology to aid in adjustment. The confidence of the individual with low vision is important to finding, learning, and using all technology (Tanis et al., 2012). Usually adults with late-in-life low vision are seen least concerned about rehababilitation and services. In addition, issues pertaining to eligibility of the individual who will use the assistive technology are much more difficult in the adult population. If not available and not understood, assistive technology will be

underutilized (Tanis et al., 2012). These are more obstacles creating gaps in the interventions of the technology for adults with low vision.

As valuable as social networking can be in the connecting process for adults with low vision, it may not be accessible for all forms of vision loss. This is where knowledge about assistive technology through educational technology will enhance the intervention process that incorporates the learning and use of technology (Anderson & Dron, 2010). Social networking can help to adults dealing with low vision, providing an avenue where they can connect and share their experiences. This can limit the visually impaired individual's dependence on friends and family, but problems could arise when accessing the virtual environment. This kind of gap in the technology use and application is due to an increased use of visual colorization on the web. A brief example was presented by Jansson and Billberger (1999), who used PHANTOM to study the effects of visual feedbacks on the perception of sandpaper texture and noticed differences in the intended and perceived image in the absence of visual feedback. However, the issue is that some adults with low vision need to use these assistive tools to make social networking work. There is a population of low vision adults that can use the general technologies with assistive platforms to stay connected.

This is a much different focus than the one presented for this study, but again should be considered in the future for technology education as an integral part of the intervention process. Thus, technology training, education, and use are part of a parcel of skills needed for populations that may not have the full range of abilities. This study hopes to understand the perception of the learner and user for continued improvement of the rehabilitation or intervention process.

The information from this study could aid in understanding present and future technology training in the intervention system that works with adults adjusting to low vision. The connections of adults through technology and the diffusion process can aid in spreading the innovation or idea of technology as a strategy in the adjustment to late-in-life low vision. The diffusion process occurs through "the need for individuals to respond to their perceptions of what specific credible others are thinking and doing" (Dearing, 2009, p. 506). In this instance, the credible others can be adults in similar situations that can spread the information gathered from use of online forums.

Diffusion can aid in the "need for individuals to reduce personal uncertainty when presented with new information," thus as adults connect with similarly situated adults there is a level of confidence about the intervention information (Dearing, 2009, p. 506). Thus, gathering data about perceptions in comparison to others' perceptions could aid in disseminating personal perceptions or perceptions of the researcher and not the perceptions of the participants. The participants who make up the population of the present study are adults with late-in-life onset low vision who have been or will be trained and possibly use technology as a means to stay connected. Nevertheless, this study does not focus on the diffusion of the idea of technology training, but on understanding the perceptions of the adults through a qualitative research approach.

Most of the research reviewed for this study employed quantitative methods of research whose results are attained by the use of statistical techniques, such as multivariate regression and ANOVA. The next section highlights the significance of a qualitative approach in addressing the research questions in the current study.

The Qualitative Approach

Leedy and Ormrod (2005) describe the nature of qualitative research as a way to "establish, confirm, or validate relationships" (p. 95). Following the determination of the research questions, the researcher chose to adopt the qualitative research approach based on three considerations. First, the research questions match the qualitative approach. Second, the contextual information adopts an experience-oriented research design. Third, there is a the need for qualitative investigation of the perceptions held by adults with late in life low vision about using mainstream and assistive technology on their adjustment process. This perception is to be seen by the researcher as if they do not know that it exists. The phenomenon as presented by the participants as suggested by Husserl and not provided by the researcher (1967).

The phenomenological study design was chosen because it provided a framework to understand the perception of adults adjusting to low vision and the use of technology as a means of staying connected through inquiry (Creswell, 2009; Moustakas, 1994). Miles and Huberman (1994) stated that it is important for qualitative studies to incorporate contextual data collection that contains precise cases of bounded and focused phenomenon entrenched within the context of the research questions and objectives. However, strictly using questionnaires limits the availability to the respondents' nonverbal response, such as gestures and tonal variations (Strauss & Corbin 1990).

On the other hand, qualitative research is integrally flexible because procedures of data collection can be emergent instead of being tightly prefigured, according to Creswell (2009). Patton (2002) expanded on this by defining the phenomenological inquiry as asking "the question, what is the structure and essence of the experience of this

phenomenon for these people?" (p. 69). Johnson and Christenson (2004) explain that this type of research allows the researcher to get close to the phenomenon and communicate value of the information described by the participants' experiences, thus seeking to understand the elements of the phenomenon.

The information-gathering process allows the participants to share their experience (Merriam, 2009). In the story of the participants' experience, elements emerge that could provide meaning or describe the essence of their experience (Moustakas, 1994). Accordingly, the nature of this research reflects an emphasis on the experiences that adults with low vision have with social networking, whose meaning is related to an inclination in the direction of a phenomenology that presents the core of meanings that the adults derive from their experiences (Moustakas, 1994).

Qualitative data analysis can be completed in differing ways, but it is often described as learning through participation or doing (Creswell, 2009). The records from qualitative data needs to be collected and organized. Phenomenology data analysis consisted of reading and rereading the stated experiences of the participants. Through this, patterns emerged. As the patterns emerged, repetitive themes could be identified (Creswell, 2009). Thus, the understanding through analysis of the participants' perceptions allows the researcher to make plausible sense of the phenomena (Miles & Huberman, 2002). In order to conduct refined data analysis, the researcher employs system coding. Auerbach and Silverstein (2003) define system coding as a process that entails the identification of concepts or themes that emerge from the data through the organization of text into categories.

Summary Statement

This chapter of the dissertation presented facts concerning the causes and prevalence of low vision among adults and comprehensively described the barriers to the adjustment process. The sections described each of these barriers in detail. It focused on discussing previous and current studies that are relevant to connections made by these adults as they adjust to lives with reduced vision. It integrated appropriate information from the peer-reviewed articles that look to the issues with adult low vision and technology. The theory of Connectivism assisted the researcher in explaining the learning foundation for adults with low vision using general technology. Technology is a primary resource in supporting low vision adults. Accordingly, the compromising issues of social networking and educational technology will be discussed. From the foregoing discussion, it emerges that low vision is a progressive visual condition affecting many adults.

No clinical interventions adequately manage the condition; thus, management of the condition relies solely on rehabilitative or intervention measures. It has been identified from the literature reviews that adults with late-in-life low vision experience difficulties adjusting to a life with reduced vision due to barriers in the adjustment process, including the inability to carry out daily living tasks, depression, anxiety, dependency, stigma, and loneliness. In this chapter, the researcher presented a critique on Connectivism as a Learning Theory, along with the challenges to Connectivism as a learning theory. From the literature review, it can be concluded that using connective knowledge, as described in the context of social networking sites, adults having low vision could benefit with sharing ideas and experiences; thus, acquire information and new knowledge. Being a member of a group, an individual could gain from the collective imagination and discourse about his/her feelings that are pivotal in generating

constructive change and achieving personal meaning and relevance. Additionally, social networking sites could create new cultural norms and conventions and new ways of approaching a task, which could prove beneficial to an adult adjusting to a life with reduced vision. Social networking sites have the potential to change how an individual thinks, learns, and interacts with other individuals.

Still, the use of technology in the context of social networking sites brings to fore technological, security, and ethical issues that must be considered when using social media as a source of information and knowledge. The researcher highlighted some of the potential social and ethical issues confronted by the users while using social networking forums. Some of potential issues include risks of loss of privacy, a lack of knowledge on how personal information provided is used, and lack of sufficient security to protect personal data from the access and misuse by individuals with such intents. Nevertheless, it can be concluded that the use of technology, more so connective knowledge as used in social networking sites, greatly improves the adjustment processes of adults diagnosed with low vision and enables them lead normal and depression-free lives.

The third chapter provides a detail of the methodological aspects of the study. It presents the research design adopted by the researcher to address the research questions. The next chapter includes the research question, the data collection procedure, and the data analysis procedures. It will follow with a discussion on the strategies that were utilized to ensure credibility of the study.

CHAPTER 3: RESEARCH METHOD

The purpose of this chapter of the study is to introduce and describe the research methodology that was adopted to collect the required data for the research. The chapter includes a description of the role of the researcher and ethical considerations taken into account by the researcher. The methods for data collection and analysis, including approaches for ensuring reliability and validity, are described. This involves the description of the research questions that generated the questions for the interviews conducted with the ten participants of the study. Details that encompass the procedures and setting of the interview sessions with the participants are included.

Research Questions

The purpose of this study was to understand the lived phenomenon, "the natural experience," and the perception of adults with low vision who received training through an intervention that incorporated general technology training with some information about making online connections with digital devices. The research questions that were mainly focused throughout the study include: In what ways do adults describe changes in their daily lives due to low vision? In what ways do adults perceive and understand the role of intervention training with computer skills that encompasses online social networking and living with low vision? What do the adults with late-in-life low vision perceive as barriers when using online social networking? What benefits do adults with late-in-life low vision perceive when using online social networking? This section entails searching past studies to address these research questions. This section will describe the research methodology that has been utilized to address these questions.

Methodology

This study employed a qualitative method of understanding adult onset low vision and the adjustment process. It sought to understand the lived experiences of adults as they adjusted to low vision and their use of technology for digital connections and its impact on their daily lives. The rationale for a qualitative phenomenology such as the methodology, the research questions, the role of researcher, target audience, data collection, protection of the participants, and how the data will be analyzed is explained in this chapter.

Phenomenology provides a means to investigate the themes that occur in studying adults adjusting to low vision, using and learning technology, and staying or feeling connected socially and economically (Yin, 2009). Phenomenology is an appropriate fit because it allowed the participants, the adults who have been adjusting to low vision, to share their perceptions of the experiences (Hatch, 2002; Yin, 2009; Moustakas, 1994). The participants shared their stories in an interview process that was guided by the four research questions.

Rationale for the Selection of a Qualitative Approach

The motive behind employing a qualitative research approach in this study is the assumption that this form of research design will assist the researcher in understanding the experiences, behaviors, and attitudes of the participants related to the phenomenon under observation (Moustakas, 1994). A qualitative research design was deemed to be most suitable, as it facilitated the researcher's interest in determining the objective reality through facts. One potential advantage of employing qualitative research design is that it

encompassed social context, interpersonal context, and cultural context in more detail as compared to quantitative research design (Mitropolitski, 2013). While conducting a research through qualitative research approach, the researcher gets an opportunity to scrutinize the perspectives and experiences of the participants regarding the issue under discussion.

The qualitative research designs are more subjective in nature and can be easily interpreted. Therefore, it allowed the researcher to establish the settings of the descriptions, analyze the data, and draw out essential conclusions that formed the basis of the research. (Watt, 2007) According to various researchers, qualitative research design is the most suitable to examine human behavior, and it assists the researcher to legalize and authenticate the information that is gathered from the diverse sources (Watt, 2007). This design of study was deemed to be significant for this study, as this method of inquiry allowed the researcher to perform a detailed and rich exploration of the issues encountered due to reduced vision and how technologies can help people to perform their routine activities.

Rationale for Phenomenology Research

Qualitative research allows the collection of rich and thick data that seeks to understand the experiences of the participants (Creswell, 2009; Moustakas, 1994; Miles and Huberman , 2002). According to Creswell (2009, 1998), there are five main strategies to the qualitative methodology. Other traditions were considered. First, biography was rejected because of its focus on the individual. Second, ethnography could be a possibility, but it looks not only to culture of the group, but also possible ethnicity (Creswell, 2009). Third, grounded theory was rejected because it involves the need to

develop a theory or understand a process. This study used the already developed conceptual framework of Connectivism.

Fourth, case study could also be a means of understanding the phenomena; however, it was rejected because phenomenological research seems to better understand the experiences and the culture of the participants. Thus, phenomenology research was chosen because the research focused on not only the perceptions but also looked to the culture of a group of individuals that differ from others because of their low vision. The phenomenology seeks to describe in rich text the experience of the individuals while seeking similarities or differences in the group's descriptions (Husserl, 1967). Phenomenology implores the researcher to bracket out past knowledge to fully attend to the instance (Giorgi, 2008).

Research Design

This study employed a qualitative research design for the purpose of data collection. The chief goal of qualitative research design is to understand the behaviors, attitudes, and experiences of the people. One potential benefit of employing qualitative research design is that it assists in enlightening the perspectives of the researcher during the process of this research along with the process of analysis, collection of data, and interpretation. While carrying out a qualitative study, the researcher typically analyzes the experiences of the participants (Flick, 2014). Based on the above benefits, this study employed a qualitative research design that was based upon semi-structured interviews.

The interview questionnaire was comprised of a variety of questions that were designed to dig into the experiences of the participants while adjusting to lowered vision, using general technologies, and social networking. Although all the questions were

designed prior to the interviews, the exact sequence of the interview questions was based upon the responses of the participants. In order to obtain clear responses, probing questions were used with the participants. The questions attempted to encourage full meaningful replies from the participants based on their own feelings and knowledge. The questions also tended to be less leading and more objective attempting, to stimulate participant emotions in the way they usually organize their thoughts. The responses based on the participants' perceptions about what was happening, thus detailing their own lived experiences. All the interviews were audio-recorded and were transcribed by the researcher in the form of field notes in the later phases of the study.

The research questions were organized to draw out the participants' stories. The discussion that emerged from the interview process described their use of technology in a meaningful manner. It built from the changes in their daily lives to their adjustment and then to detailing the barriers and benefits of general technologies. This allowed the researcher to acknowledge the uniqueness of each individual while seeking similarities or differences in their experiences and how they can aid in future understanding of general technology training as part of the intervention process for adults adjusting to low vision. As noted in the first two chapters, this study investigated through informal discussions, journaling and interacting with adults who have completed some form of intervention, and thematically analyzing their perceptions with other participants the benefits of general technology training and the adjustment process.

Role of the Investigator

I took several steps to reduce the potential for research bias related to my personal experience. My husband is legally blind and does not drive but is actually considered low vision. My husband had attended an intervention class. Our experience connected my interest and provided some ability to interview participants. I bracketed presupposed knowledge, and based on Husserl's theory (1967) looked at the phenomena as it presented itself during the study. This involved bracketing out personal suppositions in order to gather and categorize new insights from the participants. This is described as Epoch, which referred to the point of time or event that marks the beginning of a new and distinctive era (Moustakas, 1994). In order to reduce my bias, I did not interject stories of our experiences during the interview process. I did not provide my opinion and did not discuss our trials, error, and accomplishments. Regardless if there were similar or possible suggestions, the goal of the interview was only to gather the story of the participant's experience.

My role as investigator included collecting data through informal interviews, discussions, and meetings with the participants who matched the criteria of the population of this study. I noted the discussion comments or responses in a journal before I interpreted and analyzed them. My analysis specifically examined the participants' experiences after they completed, used, or attempted to use technology in their daily lives as they adjusted to low vision. I looked at the phenomena as it presented itself from the perceptions of the participants. Then I was able to interpret and possibly see connections, thus enabling me to understand any social phenomenon, as suggested by Leedy and Ormrod (2009).

As the investigator, I first introduced the participants to the topic and formed a working relationship. These participants were those selected through purposive sampling for the interviews. These participants were considered adults, 18 and older, excited from any public schooling system, and suffered from low vision. These participants were targeted through flyers, emails, and telephones. The flyers were placed in a public area. The participants contacted me first. We then continued communication. Some participants were told about the process through participants who had already made contact. A working relationship was established through emails, regular mail, and telephone calls to the interested adults who had participated in an intervention program. The initial introduction between possible participants and myself provided an exchange that explained the intent and purpose of the study, the participant's role in the study, and the benefits of this study to themselves, others, and society. A consent form was written and sent to Walden's International Review Board (IRB) for review. After approval from Walden's IRB was obtained, the research process started.

Population and Sample

This study included details of the conversational interaction between the participants and myself from the interviews settings. The interviews included open-ended questions that were designed according to the main research questions of the study. Even though all interview questions were arranged before the interview, the exact sequence in which I asked the questions depended on the responses of the participants. I did not restrict the interview questions only to a pre-determined set of questions but endeavored to establish a conversation that presented a chance for the participants to bring their significance of the study, as suggested by Hesse-Biber & Leavy (2010).

All the interviews were conducted in person in order to make sure the researcher get enough opportunity to ask probing questions in situations where the response given by the participants is not enough. Each interview lasted for 35 to 40 minutes. The interviews were conducted in the libraries and bookstores. This study embraced a purposeful sample of 10 participants. The goal of a purposeful study is to provide an "information rich" detailing of what the participants can provide during their reflection of their experience (Suri, 2011; Patton, 2004). This separates the qualitative study from the quantitative by offering "in-depth understanding" as opposed to "empirical generalizations" (Patton, 2004, p. 230).

The selection of participants is based on the purpose of the study and the ability to "go out and find some" (Patton, 2004, p. 230). This study uses a criterion sampling logic. Criterion sampling looks to participants who "meet some predetermined criterion of importance" (Suri, 2011, p. 4). The pre-determined criteria of the sample includes that individuals had low vision, be adults over the age of 18, have attended some form of intervention, and agreed to participate in the phenomenology through an interview and discussions. The participants were invited to participate by flyers on the community board in a building that provides rooms to intervention programs. The flyers were in bold and larger print. Some of the participants were referred to the investigator through other participants and members of a low vision group. The discussion occurred online, in person, or via the telephone. The goal of a 10-person sample size was achieved after many contacts were made. The process of recruitment of participants was done through electronic mail services. Posting on specialized sites was also done to attract the

participants. However, it was assured by the researcher that the participants selected are in accordance with the theme of the study.

Participants. Participants responded to flyers displayed in community areas, ten individuals completed the interview process. Although the participants had retained some vision, their doctors have designated most of the participants as legally blind because they are not longer able to drive independently. All participants were adults and agreed to participate in the interview. After we made our initial connection, we met or established a time to complete the interview. The following are brief descriptions of each participant. The participants provided enough information to make a snapshot of the lives.

Participant Descriptions. More men than women responded to the interview flyer. This phenomenon was not a factor of this research. It is noteworthy that many of the male participants were income providers prior to their decreased vision. It is an assumption that is why more male participants had access to the flyer and responded to the study. Each experience with vision loss is personal, as can be observed through a description in Table 1. Table 1 shows that 70% of the participants were male and 30% were female.

Table 1
Study Sample Population

Category	Frequency	Percent
Male	7	70
Female	3	30
Total	10	100.0

Data Collection

Data were collected during a face-to-face or telephone interview depending on participant preference. The intent of personal interviews and follow up journals was to gather the story from the perspective of the participant. The lived experiences were told through qualitative inquiry. All participants completed the interview process, and two participants followed up with a reflective journal. The data is stored in digital format or hardcopy. The consent forms are held in locked, password protected, digital files. Electronic folders were developed for each participant and then combined in a locked folder. Hard copies of the consent forms and research notes are kept in a locked file cabinet. The documents were also scanned and put into the NVivo program. The files are part of the larger locked digital folder. The data collection process began with the invitation or announcement flyers that were posted in open areas of a building that housed meetings for adults with low vision.

The announcement of the study was typed in larger print. Participants made the initial contact with the researcher. The researcher described the topic and the process over the phone. If the individual wanted to proceed, they became a participant. Then the researcher provided a consent form to gain permission from the participants. The consent form was sent via regular mail or email depending on the request of the participant. There was a self-address stamped envelope enclosed in the mailed consent form. The participants who preferred to receive it through email then return it regular mail were also provided a stamped envelope. One participant e-faxed the form with signature. The process of e-fax return of consent form provided some insight to that participant's use of technology.

The researcher and participants engaged in interviews and discussions. The interview guide provided some parameters for conducting the discussions. The responses of the interviews are presented in the next chapter under specific themes. The meetings were set up via the telephone, email, or other digital communication. Data were collected from the interview by audio recording, transcription, and investigator notes. The participants were supplied with a journal by the researcher and there will be follow-up participation checks (Merriam, 2009; Janesick, 2004).

Research Instrument. A verbal consent was attained from the participants followed by scheduling them for the interview. The interview questions were designed specifically to obtain relevant information which can help the researcher in determining the perceptions of the participants adjusting to low vision (Boyce & Neale, 2006). The questions for the interview were designed by performing an extensive literature review of the studies and literatures that address the issues related to the low vision. Prior to the commencement of interview, a list of key issues confronted by adults while using online social networking was explored (Boyce & Neale, 2006).

The questions were specifically designed to explore benefits adults with late-in-life low vision perceive when using online social networking and to obtain their perspectives regarding the role played by intervention training with computer skills while adults adjust to low vision. The questions were designed in the manner that they initiate from general to more specific (Fraser, 2004). It was assured by the researcher that the data which has been gathered is sought appropriately by stimulating the related conversations by the participants.

Instruments Used. In order to gather primary data, the researcher utilized a semi-structured interview technique. This method of data collection enabled the researcher to gather both unanticipated as well as anticipated responses of the participants during interviews (Johnson, Onwuegbuzie, & Turner, 2007). There are multiple benefits associated with the utilization of a semi-structured interview technique. One potential advantage of employing a semi-structured interview technique is that it permits the confinement of responses of the participants, which allows them to respond freely without any constraint (Johnson et al., 2007). The employment of semi-structured interviews enabled the researcher to collect data relevant to the topic and in accordance the requirement of the research. This technique of data collection was deemed to be most appropriate as it enabled the participants with intellectual ability to express and focus on their experiences.

In order to minimize personal bias based on experiences, during the interview, the researcher stayed neutral by diverting the questions that were contentious (Fraser, 2004). Although phenomenology embraces bias, the researcher wanted to hear and dictate the personal experiences of the participants and not interject my own experiences. The researcher designed questions to ensure that less monotonous responses of the participants were attained. The attainment of less monotonous responses of the participants allowed the researcher to accurately categorize and assess data (Mitropolitski, 2013). The questions of the interview were mainly open-ended in nature and enabled the researcher to get an insight of the beliefs and experiences of the participants.

The responses of the participants were critically examined to get an insight of the experience of the participants' use of technology and the social and professional connections made and maintained during the loss of vision adjustment process (Mitropolitski, 2013). The questionnaire of the interview comprised of questions that could present a broad perspective of the participants on the topic under discussion. During the interview, different questions were put forward to the participants, to which they responded as per their beliefs and knowledge.

The researcher conducted the interviews for the fixed interval of time. During the interviews, the researcher put forwarded various questions to the participants to which they responded according to their understanding and perception of the issue under consideration. All the interviews were audio recorded and transcribed into field notes (Watt, 2007). The reason for recording the interview was to ascertain that the interpretations are not affected by any personal views of the researchers. Throughout the interviews, the participants were inquired about various aspects associated with low vision. Although the sequence of the questions was pre-determined, they were directed according to the views of the responses of the participants as the interview progressed (Watt, 2007).

Interviews and Journals. One-on-one interviews were conducted with each participant. The interviews designed for this research were semi-structured, formal interviews (Hatch, 2002, p. 94). The interviews were semi-structured because the research questions and sub-questions were used to guide the dialogue. The bulk of the interview questions sought to obtain information on the Research Question:

- In what ways do adults describe changes in their lives and adjusting to low vision?
- In what ways do adults perceive and understand the role of intervention training with computer skills that encompass online social networking skills and living with low vision?
- What do the adults with late-in-life low vision perceive as barriers when using online social networking?
- What benefits do adults with late-in-low vision perceive when using online social networking?

The participants could focus on the questions and details of importance to their experience. All participants signed an Informed Consent Form (Appendix A). The interviews were completed during an established time lasting approximately 1 to 1.5 hours. After the interview, the journals were left with participants if they wanted to provide other notes during their activities. Not all participants chose to participate in the journal aspect of the research.

Two interviews were completed over the telephone because of the busy schedules of the participants; however, the rest wanted to meet with me personally in a bookstore or library. The phone interviews were recorded using a phone recording application. The other interviews were recorded with pen and paper and a digital recorder. All data collected were provided with a secure file with a password on a password-protected computer. The pen and paper interview sheets and the journals are kept in a file cabinet for the required time. The transcribed interviews are also stored with password protection. The interviews were completed between May and June of 2013.

Interviews. As discussed earlier, the researcher selected 10 participants for the purpose of interview; therefore, a total of 10 interviews were conducted. Eight out of 10 interviews were conducted in-person, while two were conducted over telephone, and each interview session lasted for 35-40 minutes. The interviews were conducted in libraries and bookstores. The purpose of the interviews were to understand the lived phenomenon, "the natural experience" of the perception of the adults who received training through an intervention that incorporated general technology training in conjunction with making online connections as they adjusted to low vision. The intention of this investigation was to understand the essence of the digital connections on the adjustment process. The interview questions were culled from the research questions presented in the first chapter. The interview guide provided discussion parameters for the meetings. This focused the discussion to the research interest of this study.

An interview guide is located in appendix C. The intent was that the interviews and discussions would assist the researcher in understanding the essence of the lives and experiences of the participants. The experience of the participants' and their use of technology and the social and professional connections made and maintained during the loss of vision adjustment process. The questions and discussions provided a means for the participants to describe their experiences. Eight out of 10 interviews were conducted person-to-person while two were conducted over the telephone. The researcher used an audio recorder with the consent of the participants. The researcher transcribed the interviews as soon as possible. The questions consisted of the four research questions with relevant probes. A familiar connection might ease the comfort of the interviewer and interviewee relationship. My husband is legally blind/low vision and is continuing to

adjust to life. Many participants may be more at ease and find an element of trust if there is a commonality (Janesick, 2004; Merriam, 2009).

Interview Setting. The researcher and the participants met at a bookstore, a public library, and two participants decided to answer the interview over the telephone. The adults provided details of their experiences with adjusting to low vision and the use of social networking technology in making and maintaining connections guided by the four main research questions. The information was gathered during these face-to-face or telephone interviews and then expanded on through supplemental participant journal writings. The participants provided the journals after a two-week period. Interviews in qualitative research are used to "uncover the meaning structures that participants use to organize their experiences and make sense of their world" (Hatch, 2002, p. 91). Ten individuals participated in the interview process; however, only two participants followed up with the journal reflections. The interviews lasted an hour to an hour and a half depending or participant.

Journaling. The journaling technique used in this study was researcher journaling. In order to preserve the responses of the participants, the researcher maintained a journal in which he noted the answers of the participants. These journals are records of "their experiences and reflections during the research process" (Hatch, p. 140). This journal process was supplemental to the interview data collected. Because this study had some focus on the social connections of adults using online forms, journaling during the experience provided a "way to get another take on participant perspectives" (Hatch, 2002, p. 140).

Data Analysis

The analysis was completed in my home office, on my personal computer. The home office has locking file cabinets within the home and office locks. All participants were located in the same state and most were in the same county. However, understanding language and differing meanings of the same word could occur during the process. Packer (2010) warned that, "Coding practices embody contradictory notions about language and knowledge" (p. 59). The coding of this research looked to each interview separately and transcribed them individually allowing major themes to surface.

Data Analysis Plan.

NVivo was utilized as an organizational aid in the coding of material. NVivo is a qualitative analysis tool that organizes unstructured or non-numerical data. It provided a means to cross-examine the data in an organized digital format. The sequence of data analysis for this study was based on each participant's detailed stories during the interview process. Some of the participants provided great detail and examples of their experiences, while others simply answered the questions and did not add more information after the probes (such as "please tell me more about" and "could you share an example" were asked. The process was to look at each question and answer by participant separately prior to moving on to the next set of interview notes.

After finding meaningful or poignant terms, these terms were listed. From there, the researcher moved to each interview. If there were similar terms, they were extracted. The meanings per participant were pulled from the notes. If there were redundancies, they were placed together on a sheet labeled with the term. In addition, NVivo was used to organize this process and to make visual aids in identifying these groupings. However, not every person had similar answers and some clearly stood independently. The next

phase was to present the findings through narration of the experience (Creswell, 2009; Patton, 2001). There were areas of commonalities and differences.

Manual Coding. Coding the research focused on finding the common threads in the data. Coding establishes the essence of the research story. According to Saladana (2013, p. 8), "Qualitative codes are essence-capturing." I used manual coding as the initial category establisher. Common words and phrases from the interviews emerged. A pattern can develop and intertwines the connections within the analysis. Saldana (2013) explained that analysis is the search for patterns in data and for ideas that help explain why those patterns are there in the first place. Working with 10 participants brought forth a lot of common areas and some uncommon statements about the research. The commonalities aided in the data organization. Regarding completing manual coding, Auerbach & Silverstein (2003) described keeping the material manageable by hearing what is said and starting the process by working each transcript separately. The research engaged 10 participants and detailed their experiences with low vision and social networking technology.

Software Program Coding. After a foundation was established through manual coding, NVivo was employed to aid in some graphics and keeping up with the organization of the data. NVivo is organizational software that aids to organize the data (QSR International, 2010). NVivo has the ability to create models with ease that is connected to the items they represent. Then NVivo can reshape and reorganize the thematic presences within the research as well as the data that was not similar through all participants.

Manual coding in the initial review of the data allowed themes to emerge in the data. It provided a means to understand the data (Auerbach & Silverstein, 2003). NVivo allowed me to be more organized with the concepts provided by the participants. The participant size was 10, which included some diversity for manual coding. Reflections and expressions based on patterns and differences in the perceptions of the participants provided the details.

Validity of the Study

Moustakas (1994) described the validity of a phenomenology as "establishing the truth of things" (p. 57). Qualitative research looks to several different types of validity and phenomenology seeks the verification of the understanding of the experience. The participants reexamining the unified descriptions of the experience can authenticate the experience. Creswell (2009) provided questions that the researchers might ask in checking to see if the context of the structure provided an accurate portrait. These questions seek to clarify the researchers' influence on the participant, the accuracy of the transcription, the possibility of alternative conclusions, the ability to make connections between the original description of the participants and the generalized structural descriptions, and if the structural descriptions were situation-specific. Trochrim and Donnelly (2001) and Creswell (2009) present the importance of authenticity, credibility, and dependability. Integrating the information from reliable and authentic resources ensured the authenticity of the research. The credibility of the research was assured by making prolonged and extensive interactions with the participants at the time of

interview. Triangulation method was employed by the researcher in order to enhance the dependability of the study.

Discrepant Cases

According to Maxwell (2005), part of understanding the validity of qualitative research is to seek or analyze discrepant data or negative cases. There were some discrepancies between the perceptions of benefits, barriers, and uses of technologies between the participants. The sample size provided differing experiences in the descriptions by the participants. An example of some differences in participants' answers could be how they used technology, how proficient they felt they were with technology, and when they started using technology. However, the foundational common thread was that they all use technology. Accordingly, the differing uses of technology could lead to differing responses.

Evidence of Trustworthiness

The dependability of research relies on the practices of the researcher and the consistency of the findings, including the application over time. This study was written using the best practices in research as required by the university and the IRB system. The participants were provided confidentiality statements (Yin, 2009). They were provided a list of public services that could aid or assist them if they felt the research was not done in a respectful and trustworthy manner. The initial meeting and a review at the interview with the participants detailed an explanation of my role as researcher. In order to maintain the levels of allowed bias, I explained that my husband was also an adult with low vision, but maintained that my goal was to hear their story. If they felt I was intruding or changing the story, they could stop the process. The interviews were

completed at libraries and bookstores the participants could easily access, and where there was a public presence so they did not feel uncomfortable about the process. Two interviews were completed over the telephone per the participants' request.

The participants maintained anonymity based on the pseudo names provided to them in the written section. The data were collected, transcribed, and analyzed directly from the words provided by the participants in telling their lived experiences. The interviewees were sent copies of the transcript of the interview and discussion. The participants were able to review the transcript of the discussion and make any changes if they feel something was not represented or was represented incorrectly. The data is stored in a home office in locked file cabinets or the home computer with password security. Creswell (2009) explained that a researcher should use a minimum of two strategies to develop the quality of their research. This study included rich descriptions, the ability of the participant to withdraw from the process, and the ability to read and review their transcript.

Credibility

Interviewing the participants allowed the researcher to ask questions and listen to the experiences of the individual. The interview process was part of the rich data collection and the framing of the issues and perceptions the adults shared about their adjustment to low vision and their online connections. Siemens (2014) stated that as people "we take small pieces" of our and others experiences, "we mix them" from that "we can create personal understanding" (p. 74).

The experiences of the participants included some similarities, but each participant is an individual, thus the differences in their lives and how the vision loss,

acceptance of vision loss, and use of social networking, varied. As highlighted earlier in the same chapter, the credibility of the study was maintained by a prolonged and extensive interaction with the respondents during the interviews. Effective and healthy interactions established with the participants allowed the researcher to built an understanding of perspectives and experiences of the participants. In this manner, the credibility of the study was enhanced.

Transferability

The aim of this study was to understand and tell the stories of the lived experiences of adults adjusting to low vision and their use of technology devices to stay connected socially and/or economically. This research contributes to the phenomenon of their experiences. Additional research could continue to create depth in the understanding process for adults and professionals working in this field. The results of this study could be transferable to other adults who have a change in their senses and have to change some of their daily routine and habits.

Accordingly, others can examine the study for an understanding of the use and skills for staying connected through digital technology. This research can be referenced when studying similar situations in other states and countries. It is not limited to adults with low vision; information on use and continued use of social networking could be useful for minors entering adulthood. The transferability of the findings and results of this particular research was enhanced by providing detailed descriptions of the responses of the participants that permitted the researcher to evaluate the applicability of the findings to other contexts.

Ethical Considerations

Compliance with the requirements with Walden IRB was part of the study. Confidentiality was incorporated in the research procedure. Files that require passwords stored the information on the computer. Locked storage was available for the interviews and discussions that were recorded. The transcripts were kept for five years. The participants were identified by pseudonyms, and this anonymity was explained to them prior to participation. There was a consent form submitted for acceptance by Walden and provided to the participants. The risks and benefits were explained in the form. The basic purpose of the study was communicated. If participants wished to withdraw, they could at any time. The researcher was conscious of the fact that honesty is fundamental, not only to permit direct familiarity, but also to prompt a level of dependence and trustworthiness in the outcome of the research. The primary principles of research are frequently universal and comprise matters such as sincerity and reverence for individual rights. Therefore, it has been ensured by the researcher that the findings and results obtained in this study are the facts stated in the preceding literature and not based on representation of the actual statements and ideas of previous researchers. Any counterfeit allegation or information has not been depicted by the researcher in this dissertation. Considering the fact that researcher is a reviewer of the work of other researchers, it has been ensured that all the findings and information is cited and referenced appropriately.

Summary Statement

This section of the research study chapter included a description of the qualitative phenomenology form of inquiry. Phenomenology is the best method to address the research questions and the form of data collection that will be part of this study. This study relied on the participants' experiences and the perception of their experiences. The

study sought to understand the essence of the adjustment process of a specific group of people in relationship to using and learning general technology as a means to stay connected. A purposive sampling technique was employed by the research since it allowed the selection of those participants who were experiencing low vision in their late life.

The researcher's commitment to ethical considerations throughout the course of the research was emphasized. Prior to the commencement of the research, an approval was obtained from the legislative bodies of the university. Moreover, the participants were presented with the concern form that discusses all the aspects of the research. The interview was performed with 10 participants experiencing reduced vision. The interviews were made in-person and over a telephone call. Each interview lasted for an hour to an hour and a half.. The primary data were collected by the means of semi-structured interviews. The intention behind employing semi-structured interviews as a main tool for data collection was to obtain the viewpoints of the participants.

The researcher explained that the interview questionnaire comprised of open-ended questions and the sequence of questions was determined by the responses of the participants. Ethical concerns were observed in all the phases of the research by providing the participants with a consent form that discussed all the aspects of the study. All the data obtained through interviews was destroyed after receiving approval from the concerned authorities of Walden University. This section included the research design, data collection method, sampling procedure data analysis plan, sample population parameters, treatment of the participants, and the procedure for working with the participants that identified methods for ethical procedures.

Chapter 4 discusses the results of the study. It begins with a detailed description of the data collection and analysis process carried out during the investigation and moves on to a discussion of the results of the study. In particular, chapter 4 frames the responses provided by the participants during the interviews and their perceptions in relationship to each research question.

CHAPTER 4: RESULTS

The purpose of this chapter is to provide information regarding the process of the study and its findings. The primary source of information for this study was gathered during the one-to-one interview process. The demographics of the participants are presented in Table 2 below. Following the demographics table, the stories of the participants are set in a parameter developed by the interview guide. The responses of the participants are provided in narrative. The findings of the interviews beginning with a demographic description are also summarized and discussed.

Table 2
Demographics

Name	Age	Gender	Employment Status
Margret	50	Female	Employed as a therapist
Sophia	35	Female	Employed part-time
Abbey	37	Female	Employed as a teacher
Henry	39	Male	Employed and hired a driver
Larry	57	Male	Employed, works at home
Joseph	28	Male	Not employed
Daniel	49	Male	Employed as a financial planner
Kyle	45	Male	Employed as a consultant for adults who are losing their vision
Alfred	63	Male	Retired
Barry	47	Male	Employed

Overview of the Participants

Margaret is over 50 years of age and still employed as a therapist. Her vision loss occurred in adulthood. Her vision continues to diminish. She has a computer at home and at work, but described her technology use as novice. She does not feel comfortable without her husband or colleagues to assist her with computer issues. However, she does use a computer daily. She describes the programs on her system as dated. She feels they are not as current as they could be, but they work for her and she knows how to use them. She described that sometimes her lack of knowledge is frustrating, but in general, she has

support at work and home. She mentioned being a little weary of updating her computer. She is considered legally blind due to her inability to drive but maintains enough forward vision to use a computer. She stated using voice recognition software, but not for everything.

Margaret describes the process of adjusting to low vision as scary since she is still working, and most of her colleagues still maintain more vision. She felt demoralized at first, but described slowly gaining confidence. In time, she realized that some of her colleagues were there to support her. She described still having trust issues with strangers. An example is when she visits the mall. She will go with her husband and walk by herself, but he will not leave the mall. Margaret has a vision dog. The dog helps her with being around some strangers. The dog has aided in her issues with mobility. However, she stated that it now takes her more time to get from place to place and that she tries not to use public transportation because it is unreliable in her town.

Sophia is in her thirties and is employed part-time. She works with others who are also dealing with vision loss. She is married to another participant, and she wanted me to know that their household is low vision. She considers her computer connections as very important. She described the ability to speak over Skype and other applications as very important. She does not like to type on small devices. Sophia stays connected to clients, family, and friends through Skype and Tango for talk and text.

Sophia can use the computer independently. She prefers to fill out her forms online using Magic. Sophia has been living with low vision since she was in her twenties and had to learn to carry out her daily living activities without full vision. Sophia decided she could do everything her full-vision friends and colleagues could accomplish. The

major challenge for her was that socializing with her friends changed. Some of her friends did not want to be close to her anymore. She has had to make new friends and find ways to socialize that do not always entail going out. Sophia and her husband use public transportation, which she described as a change from their previous routine. She described her desire to live somewhere she could walk to work, restaurants, and entertainment.

Abbey is in her late thirties. She is a teacher. Technology is very important to her. She likes to take any classes provided to her through the state or through her teaching affiliation. Abbey echoed the feeling of frustration especially when she was prohibited from driving. Her vision loss occurred gradually, and when she could no longer drive, it was a true realization that her vision was not going to return. She mentioned researching places in the United States that may not be as prohibitive to live as her current residence. Abbey, similar to Sophia, would like to be able to access places easier. Abbey mentioned the lacking bus system in her area. She referred to the Internet as a great asset, but face-to-face contact is also very important. She does use computer programs such as school email and chat to connect to peers and students.

Henry is in his late thirties, employed full-time, is still very active, and uses technology regularly. He has the financial resources to employ a driver. He shared that this has also been very important to him. Having a driver has helped him maintain a sense of independence and the ability to work away from his office or home. Henry did not talk much about his experience and answered the questions and probes fairly briefly. It appears that he would, similar to all the participants, prefer to have his vision, but is very comfortable in his situation.

Larry works at home and is in his fifties. He could retire and collect Social Security, but decided to decline. He wants to continue working, and technology is a big part of his continued ability to work. He enjoys his work because it keeps him in contact with others and he earns more than if he were to collect Social Security. Larry described what he terms "functional changes" that had to be made due to decreased vision. Some of the changes included the need for increased lighting, larger screens for his computer and televisions, fully encompassing sunglasses in bright sunlight, and a white cane to assist with walking. He described these changes as functional because they were added without much interference to his already established routines. Although he would prefer to have his vision, he has been surprised at the people in his community that help him when he is out and about. He described people helping him cross the street, finding him a seat at church, and generally being considerate.

Joseph is the youngest participant. He is in his twenties and vision loss occurred because of an accident. He described himself as an active and knowledgeable computer user or technology enthusiast. However, the loss of vision has been very frustrating for him. His friends have changed since high school and since his accident. He goes through periods of isolation and disappointment. He described a sense of sadness due to the change of his set of friends, yet explained that he has a renewed sense of God. The sudden loss of vision forced him to stay at home most of the time. It is difficult for Joseph to get into town. Public transportation is not always feasible from his rural area. He can request bus or shuttle transport, but the town bus does not automatically go to his rural area.

Daniel is in his late forties. He is a financial planner. He struggles more with his distance vision. Community networking in person and through technology is very important to him. He stressed the importance of his professional connections and how he may make them in person but does a lot of maintaining of his connections through the computer. Daniel appeared to be accepting of his visual condition. He mentioned that he considers continually checking with his doctor to be very important. He has children and does not want to lose all of his sight.

Kyle is in his forties and seems have the least amount of vision of all participants. He states he has already adjusted and is currently planning for when he has no vision. He is learning Braille. He is also working with the intervention training programs so he can continue using some of his favorite gamming programs. The game he mentioned the most was War Craft. His connections are with family and other adults with vision loss; however, his new connections and social interactions are with other gamers. This has been a great platform to meet or socialize in some capacity with others, especially after the beginning of his vision loss. He does not want to lose these interactions due to complete vision loss.

Alfred was in his sixties. He was one of the older participants. He no longer works, but is a volunteer. He retired early because of his vision. His lives in an adult community and keeps up with his neighbors. He provided a lot of compliments about his move into the adult community. He mentioned being active in his church. Alfred was very brief in his answers. He did not complain about his vision.

Barry is in his forties and continues to work. Prior to Barry's vision loss, he had worked with the same company since he was young man. He started on the docks as a

dockworker. He stated that he worked his way up and eventually worked in the offices. He said vision is very important in those types of jobs. Due to vision loss, Barry eventually lost his job and moved to a different state that he described as more accepting. When we met, he was working as a tour guide. His position is stationary: he does not move with the tour, but he gets to talk to many people all day. He mentioned that very rarely does anybody ask him if he was blind. Barry is not fully blind. Like all of the participants, he retains some vision.

Outcomes by Research Question

The research focused on adults adjusting to low vision and their use of social networking via computer or other digital devices as a way of making and maintaining family, social, and professional connections. The answers to the research questions provided a look at the individual's story – a snapshot of their experience with low vision and staying connected digitally. The experience of a person is a vast and continual process, but this research tried to pinpoint related parts of their story and a relationship to their use of technology devices to utilize social networking. There were four primary research questions that guided this study:

Question one asked participants to describe changes in daily living since the onset of low vision. This was a broad question that aided in establishing general changes in daily living. Question two narrowed the scope to technology and asked participants to briefly describe their perception of intervention training and the part of training that encompassed some online social networking information. Question three and the sub questions examined the participants' understanding of the barriers that the participants face when using social networking. What did the adults with low vision perceive as

barriers when using social networking? Question four asked what benefits adults with low vision perceived when using social networking. The sub questions queried more information about the benefits.

Results by Interview Questions

Research Question One. The first research question asked the participants to describe the changes in their daily routines while adjusting to low vision. The discussion provided from question one concerned daily living routines, but included what was considered a significant change to schedules. The notion was that the schedule had to change because of the vision loss, thus adaptions were put into the schedules of the participants for limited vision.

Figure 1

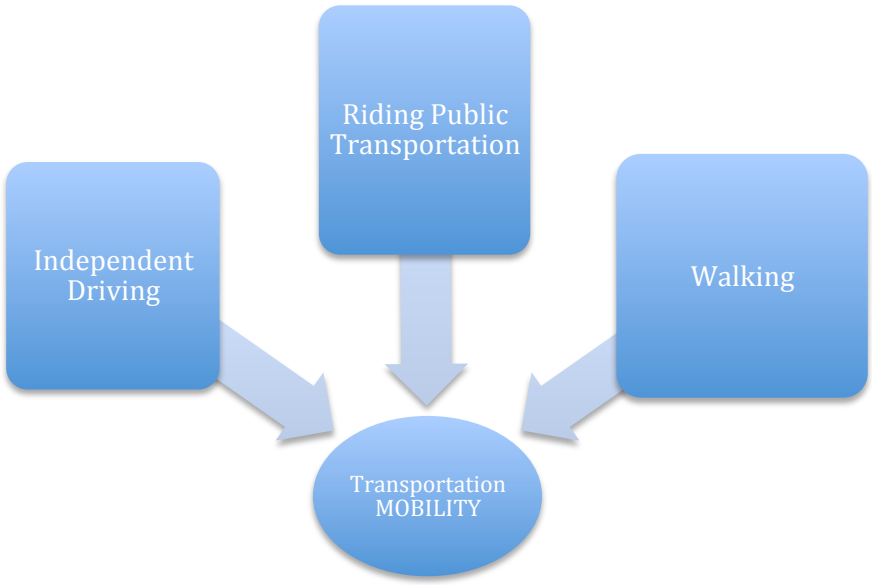

Figure 1: A graphical depiction of the terms and issues of changes in the participants' daily routines while adjusting to low vision.

The main issue for all participants was mobility. *Figure 1* identifies the main issues and fans out to all the types of challenges overshadowing mobility. The conversations with the participants about mobility led to the concept of mobility out of house and inside their house. Under the category of mobility were several variations of the exact lingual meaning of mobility. The main topics that developed under question one and two were the use of a car or the ability to drive, dependence upon others, public transportation, the impact of riding a bike, scooters, and other devices. A couple of the participants described the possibility of riding a bike or a scooter, but that option was considered to be too difficult for others.

Larry's response: "I can ride my bike, but I do not have any peripheral vision. That is hard in town." Accordingly, vision loss also changed walking. Some participants

use white canes, and one of them decided to get a guide dog. For example, Sophia's response: "I finally pursued getting a white cane because when I bumped into people, some people wanted to fight. The white cane at least identifies the blindness."

Mobility and transportation became the key terms that lead to the types of mobility and the means of transportation as displayed in Figure 1. These terms were the general reference to how the participants described "getting around." Mobility included walking in the home or office. Correspondingly, mobility is how the participants were able to participate in their community events, such as church, shopping, and visiting restaurants and other community places. Some of the responses from the participants who had vision loss longer than others described these activities as easy or simply part of their current daily living activities. They recalled the times when they could easily visualize the things and did not suffer from low vision. However, Larry and Henry both voiced that the inability to drive was the worst part of losing their vision, at least in regards to transportation.

The significant change in schedule was also relational to mobility. Henry's response: "My schedules were impacted because of the reliance on others or reliance on public transportation that had become part of my routine." Here Henry details how adapting to decreased vision changed his schedule. This includes time to complete tasks that were once completed differently with vision. Henry described no longer being able to "hop in the car."

If Abbey, Henry, or Barry scheduled an appointment, they described having to schedule based on the driver or the public transportation itinerary. Included with the loss of mobility for some of the participants was the change in the dynamics of their face-to-

face connections. Alternatively, participants, especially Abbey, described new connections with individuals they met by participating in public transportation. Some of the participants described the joy of meeting new people, while one participant described "feeling secluded by having to ride a bus and not sure of other people and the safety." Thus, changes in the type of transportation were discussed during the interviews, which led to discrepant views on how they reacted, interacted, and used transportation. Some participants embraced the idea of public transportation and change in mobility, while others were more cautious of the idea.

Research Question Two. The second research question asked, "In what ways do adults perceive and understand the role of intervention training with computer skills that encompass online social networking and living with low vision?" Most of the responses indicated that they received little training when they contacted the Office of Vocational Rehabilitation (OVR). For instance, Abbey responded: "I received basic training through the OVR and also received training because of my occupation as a teacher. Although my teaching training was not provided because of my sight, I learned many things about the computer that did come in handy when socializing or researching online. Others received training from the state."

Alfred also received training, and he responded: "I received training from the state of Pennsylvania, which included the use of assistive technology" with the use of a computer and mobility for day-to-day activities. The assistive technology aids in using the social technology. In some instances, it makes staying connected easier. The assistive technology most often reviewed in OVR for the participants and my husband were the voice recognition programs. In addition, some participants are provided assistance when

they call the state. Alfred had contacted the state directly. Similar to Alfred, Larry contacted the state directly and he responded: “I have been attached to a case representative who offers almost everything I need that would or might help me continue to work. However, I have to call and initiate the new contact. I always used social networking, and the information is usually a review.”

Sophia responded, “Technology acquires immense significance for us. It is an essential constituent of our daily activities since it allows us to stay connected professionally, with families and friends.” Sophia said that in-person meetings were her preference, but like most people, “using technology like FaceTime is a great advantage and pleasure.” She went on to describe her ability to figure things out on her computer independently, but “things change so fast, sometimes extra help is appreciated.”

Sophia and Daniel provide a key point about the importance of technology and continued training, provided by Daniel’s response: “I strongly believe that more training is necessary.” On this response from Daniel the researcher put forwarded a probing question, asking, “Could you share an example?” In response, Daniel replied that current training practices are insufficient to educate people with low-vision about different technologies. It was inferred from this response that Daniel was speaking of both general and assistive technologies and need for continued training.

Joseph’s response spoke specifically to the use of voice technologies: “Voice technology was significant among different technologies as it aided in their continued connections and provided a platform for learning or gaining information and joining groups with similar interests.” Kyle’s response contrasted with the responses of other participants since he strongly believed that intervention training with computer skills

couldn't benefit people with low vision much. Kyle responded, "training people about various technologies is not a good exercise to make them adjust to low-vision."

The discussion on time and amount of training differed among the participants. One participant described it "as a good review, but not anything new"; however, another participant's description explained that "times sure have changed; there is so much available." These descriptions do represent Siemens' (2008) idea that "learning and knowledge is based on diverse opinions," as well as the thought that "learning is also a process that connects sources" (Siemens, 2008, p. 11).

As an example, a theme that developed under the question concerning training was the quantity of time spent on general technology review or training. In relationship to quantity was the quality or the depth of training received through training and intervention. Figure 2 below identifies the level of training the participants described in their interview sessions. Some of the participants described the independence, but others wanted to be shown how to complete some tasks concerning the computer and social networking.

Figure 2

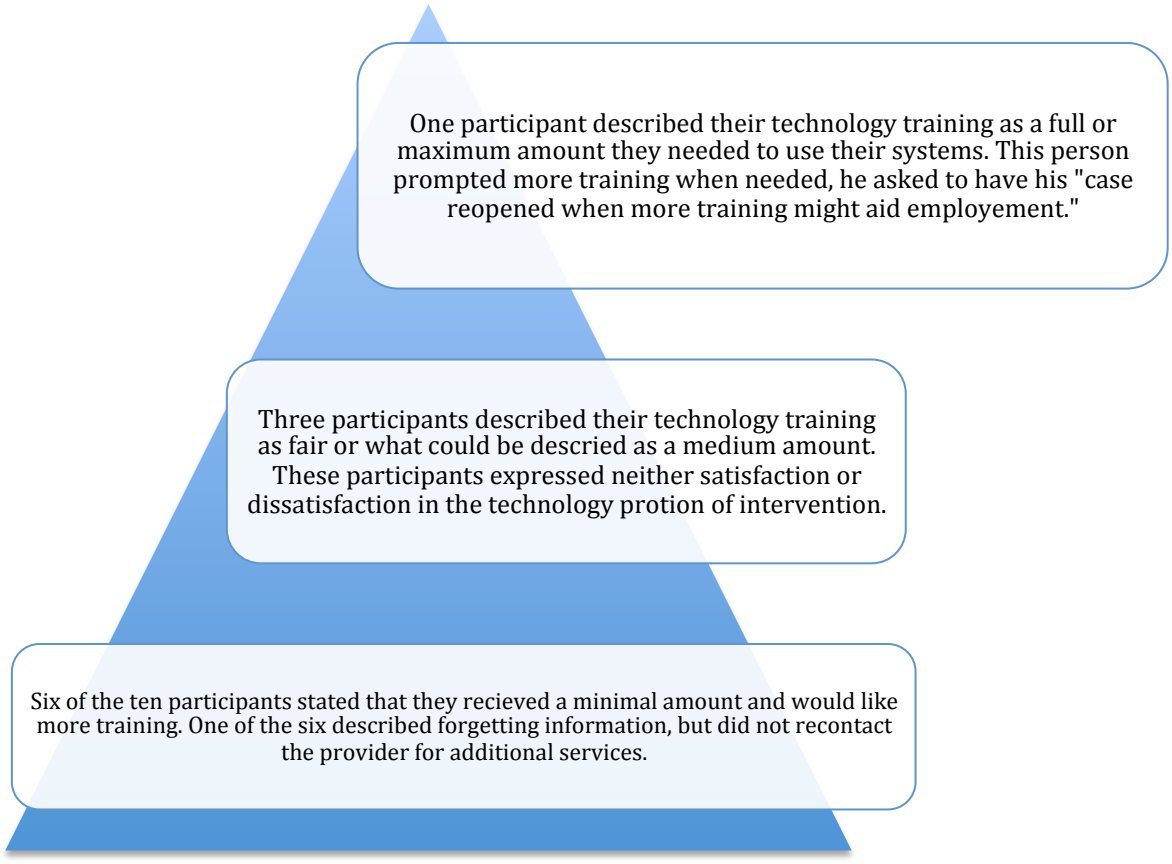

Figure 2: A pyramid depicting the levels of intervention training received by the participants of the study.

From the responses provided by the participants and the details in Figure 2, all participants were in contact with and participated in some form of training. The participants described a variety of different types of training. The amount of time they each participated in training varied.

Research Question Three. Research question three dealt with the participants' perceptions of barriers when using social networking. The main concepts that emerged from this section were cost, time, and loss of privacy. Some of the respondents explained that software, hardware, and application updates that the sites and devices required were difficult to install. One of the barriers was based on the word size of the instructions, and

some were not able to get the instructions via voice. For instance, Kyle responded, "I could not update this one page on a social site because the update information did not recognize voice commands." Margaret responded: "My computer system is probably outdated. I did not even know what version of (Microsoft) Word is current." She used her work computer more than her home computer because she had not updated her document program at home because of her older computer. At work she relied on her colleagues to assist her in keeping that computer updated. She added that she wished her home were equipped with a technology or IT department to help her with her home updates.

Kyle's response considered the issue of time. Kyle described how often computers and tablets need to be updated. He stated, "Updating systems is time-consuming, which infringed my spare time." He talked about the frequency of updating seems to be more often than in the past. He discussed the issue of "you have to turn off your computer and wait for it to start again."

Alfred had a different concern than the frustrations of time and availability. Alfred responded: "Social networking is a good source of interacting with others. However, it can lead to loss of privacy." This lack of privacy can be a deterrent to using social networking. Programs and devices, including websites, gather more personal information than ever before.

Based on this response by Alfred, I used a probing question: "Please share something more about that." Alfred responded, "Many individuals, particularly belonging to my age, group lack understanding about how to establish privacy on these networks. As a result, a considerable amount of our personal information can be put at risk." Again,

the subject of data mining was touched on and how "even the news talks about being careful because personal information is collected all the time."

Another barrier described by many of the participants was the additional expense they have incurred to keep up with technology. Some may receive assistive technology from their state or local intervention program; however, the individual and not the intervention program purchase the general technologies and devices. Figure 3 below recognizes the issues related to cost and expense. For example, one of the participants described online gaming as part of his social world, especially since he experienced vision loss, but many of the games are very expensive, or to go further in a game often requires paying a fee.

Figure 3

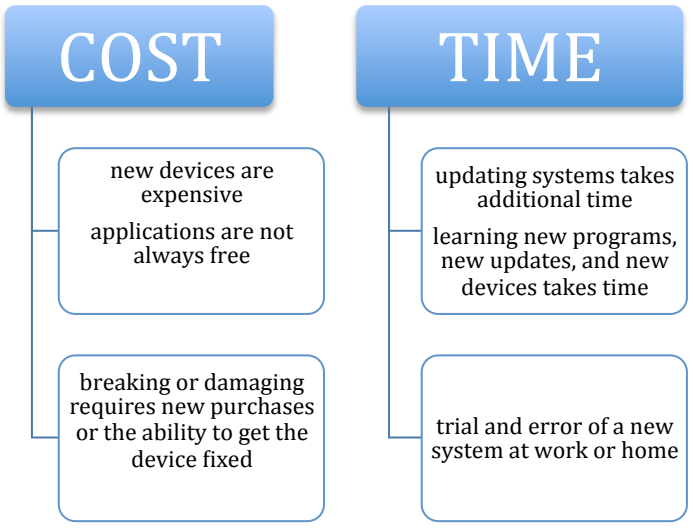

Figure 3: A graphical display showing the two main barriers of cost and time as described by the participants in using technology.

Figure 3 above describes the cost and time elements which were considered as the most probable barriers to the utilization of technology. The cost in the above figure is considered as a barrier because new devices are expensive. Moreover, their damaging and damaging requires more cost. Therefore, time is considered a potential barrier for the

reason that updating systems entails extra time. However, cost and time are not the only barriers to using technology. An additional challenge described by the participants was difficulty reading some of the information on websites.

Joseph's response was, "Due to low-vision, I can only access Facebook at home, where I have a larger screen. However, my phone is set up to voice most activity." Joseph expounded, saying that not all phones come with that capability, and some phones require an application. Joseph's phone only needs to be adjusted in the settings in order for it to tell him what is happening as it is happening; however, there is some delay in speech. Conversely, the small screen size of smart phones was a deterrent for most the participants who used social networking sites.

Similarly to difficulty in reading, another challenge described by some of the participants with more decreased vision was using video conferencing on Skype, which cannot be possible without a large screen. They explained that so much is based on a picture or a video, but if you cannot see the picture or video, there is diminished need in using those sites. The last barrier thread that many participants described is time.

Barry's response concerning time as a barrier to using a computer was, "It utilizes time when using technology since updating systems take time. The new devices take time to learn. This consumes more time than they intended when sitting down to use their computer." Barry's response is similar to Alfred's response posed earlier. There is a process in updating technology that takes time. Barry talked about wanting to get on the computer quickly to look something up, but there was always a notification flashing. Barry said that this meant, "Time to get a cup of coffee."

The terms used most often to describe some of these barriers were frustration and irritation. Furthermore, the causes of the frustration led to several different terms that had similarity among the participants. The physical barrier to using general technologies was the change in the participants' vision. Each participant described his or her remaining vision a little differently. The use of phenomenology in research provided the researcher and the participants the ability to communicate in greater detail during semi-structured interview processes. Many of the participants – 80 percent of the total interview population – tried to describe their type of vision or what it was like to look from their eyes. Some of the participants described looking through a tunnel; other participants had spots in their line of sight. Another person described having to look around a circle in the middle of the eye. Larry said he felt like there was a line diagonally across his eye – he could see over top of the line, but nothing underneath. This state of vision is referred to as astigmatism.

A supplementary barrier but eventual benefit was finding some assistive technology that might enhance their use of the general technologies so they could stay connected via social networking. Finding assistive technology was helpful, but there is a period of time when learning new assistive technology presents a challenge. Again, for some participants, the idea of assistive technology was embraced, but others were cautious or frustrated with the learning activities. Figure 4 visualizes the main barriers to technology discussed during the interviews. The next section describes the benefits to using technology.

Figure 4

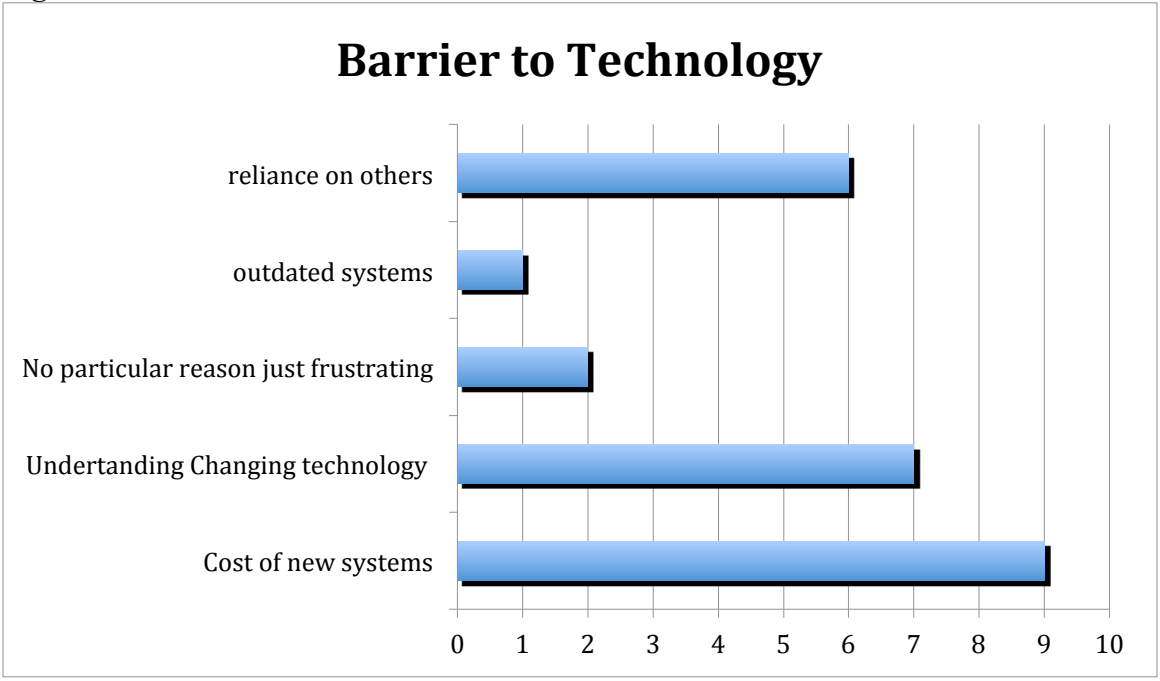

Figure 4: A bar graph display of the barriers to technology.

Figure 4 visualizes the main barriers to technology discussed during the interviews. It can be deduced from the above figure that cost of new system is the major barrier to the utilization of technology. Moreover, understanding changing technology is also depicted as the potential barrier to technology. The next section describes the benefits to using technology.

Research Question Four. The fourth research question moved forward from the interview questions based on barriers to the interview questions looking to the benefits of using online social forms and general technology. This section brought forth very interesting and enthusiastic conversation during the interview process. To many participants, online social networking sites were a place of comfort. These digital places allowed the participants to mingle with their far-away friends, family, and colleagues. For

instance, several participants still use and rely on emails to connect with their relatives and friends.

Abbey's response discussed how she used social networking. She said, "Through social networking, I am able to connect with people from college and people who I have not communicated with since before my vision loss." Abbey said that the connections she made online were important to her. Abbey used social networking sites to make these connections.

Barry responded: "I was able to keep in touch with children and grandchildren using Skype." His son and family introduced him to Skype. Skype and other tele, computer, visual, or voice connections allow people to communicate over great distances. The connection through Skype made many of the participants feel happy and more relaxed considering their issues discussed about transportation. In addition, the same participants described finding learning materials a vital part of online access.

Margaret added the element of continued education and the benefits of technology. Margaret responded: "I use a learning site to find resources relating to my field of counseling. I can take continuing education classes online and not schedule in travel." Margaret seemed to prefer gaining access online and not having to go far from her home or work.

Henry, who wanted to continue to be in a career, responded: "Websites such as Facebook and LinkedIn allow me to share not only personal connections, but also professional connections." In addition to Henry, Margaret, the counselor, and Abbey, the teacher, can find professional support groups and learning groups online. This is not to say that their initial use of social networking sites was not met with some skepticism or

caution. Margaret had her daughter taught her how to use the website and she only used certain sites. She does not let anyone know that she has decreased vision. Online security and a sense of self are important concepts when using and feeling at ease with online settings.

A benefit of technology that came up in discussions that surprised me was the ability to save information in a work database or a Cloud. The Cloud system, although having a monthly premium if a certain amount of space is used, did save some of the participants money. These storage capabilities decreased the reliance on memory cards, flash drives, and discs. The discs and flash drives are easy to lose or simply misplace because they are small and hard to see. Thus, moving to the Cloud system decreased the amount of misplaced information on flash drives or discs. One participant described the frustration of misplacing things in correlation with decrease in her vision. Sophia stated that she could save pictures on a flash drive and totally forget where it is. She learned that certain stores would enlarge pictures if she sent them through an email. This way she does not have to worry about a flash drive or going to the store. Here too were some positives to the use of a general technology. I asked Larry about the cost of the Cloud, and as far as he was concerned, it outweighed the cost of replacing discs and drives. “It’s just the new way of saving things in one place.” Again, some participants were skeptical and the adaptation of some technology takes longer by some people and less time by others.

Accordingly, many participants shop online more now than before their vision loss occurred. Online shopping is time effective, especially when you take into account that no time is needed for public transportation. In addition, sometimes carrying

everything home on a bus is difficult. Alfred likes to search online for items that benefit his hobbies. “You can find lots of odd things online.” He also described being able to research certain products then finding recommendations on where to buy the items. Conversely, another participant said although online shopping is easy, going to a mall or a store is something she misses.

Larry responded: “Another benefit related to general technologies is the applications on many of the smart phones. Several smartphones have incorporated speech applications or settings. The participant does not have to purchase an assistive technology when voice is already available through an app or the phone itself.”

Joseph responded: “Voice enabled text messages are much easier than typed messages. The merit of a smart phone is the portability, and with voice recognition applications or settings, they are convenient, too.”

Figure 5

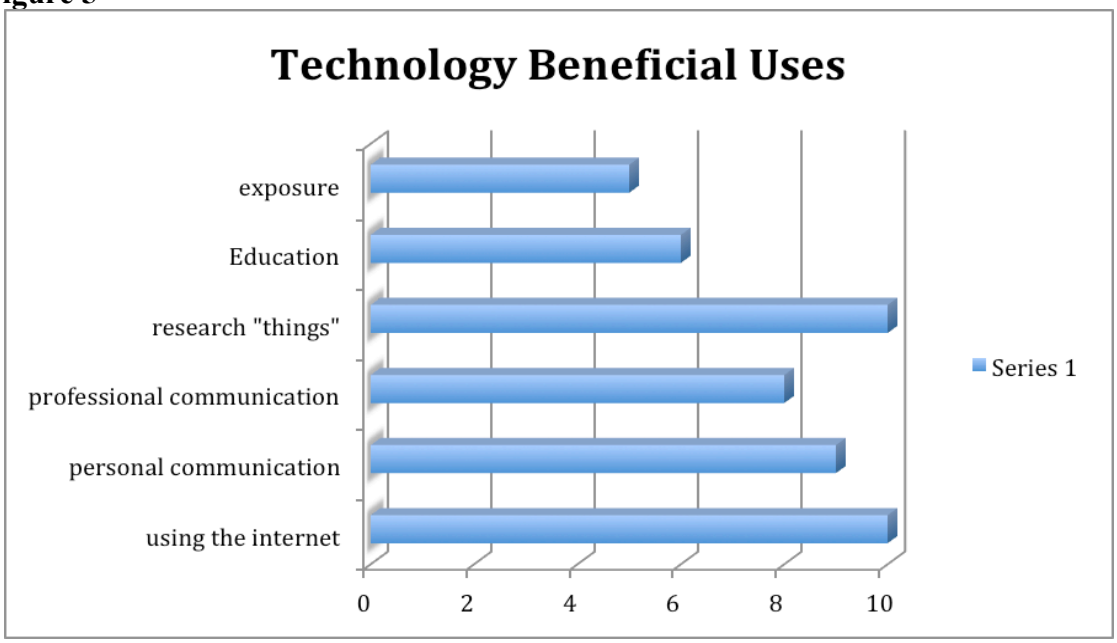

Figure 5: Perceived benefits of using technology

Figure 5 above illustrates the responses of the participants when asked to speak about the benefits of technology. The majority of the participants highlighted that technology allows them to utilize the Internet to search many different interests. A significant number of participants also pointed out that technology helps them to establish personal and professional communication. Five participants explained that technology assisted them to fulfill their educational purposes. From the perspectives of the participants some of the issues of frustration were later reevaluated when talking about the benefits of general technology. The benefits of general technologies for adults with low vision encapsulated the ideas of Goffman (1959) and Seimen (2008), this included the use of social networking and technology in general the idea of connecting and continuing the feeling of self. These continued connections and new connections aid in the individual's continued participation in self and their self in relationship to the parts of the daily lives such as home and work.

Figure 6

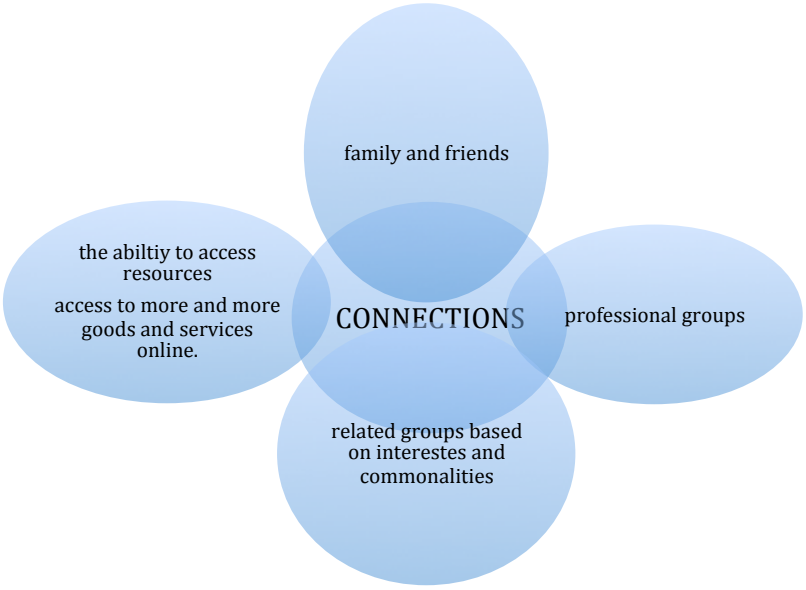

Figure 6: A visual display of the benefits of online connections as mentioned by the participants of the study.

Figure 6 above illustrates the types of connection an individual needs to make in order to survive in the society. These connections include connection with professional groups, family, and friends. Moreover, the figure embraces the connections that are required for success. A major theme that developed through the research question on benefits was the ability to connect and having connections with others. Online social networking is a means of making and maintaining connections. The social networking site mentioned most often was Facebook. Abbey, Margaret, and Sophia all used Facebook. Two of the males, over 40 but younger than 55, did not use Facebook. Daniel was a registered user, but lost interest. Daniel does post work-related information on Facebook and LinkedIn. Other beneficial sites of the Internet mentioned by the participants were JoinMe, Mikogo, LinkedIn, Team Viewer, and Partner Up. Only one person mentioned regularly using Twitter. Daniel, Henry, and Larry mentioned that their businesses used Twitter. However, only two of them occasionally added tweets.

Summary Statement

This chapter of the study demonstrated the response of the participants of the interview organized under each research questions. From the responses of the participants, it can be concluded that mobility is the major issue confronted by the participants due to their low vision. Lack of mobility affected the participants' participation in their community events, such as church, shopping, restaurants, and other community places and events. Some of the participants highlighted that they need to rely on others when they want to go somewhere. When asked about their perception regarding

the role of training, the majority of the participants highlighted that they received little training when they contacted the Office of Vocational Rehabilitation (OVR). These trainings proved to be beneficial for the employees. In response to the third research question, the participants described the barriers which they felt have obstructed their utilization of technology. From the responses of the participants, it can be depicted that cost, time, and loss of privacy are the major barriers to the utilization of technology and subsequently social networking. Moreover, the participants have also highlighted that lack of proper vision has limited their utilization of technology in their homes. According to the participants, technology has played a vital part in changing their way of living. It has enabled them to interact with friends and relatives who they were not able to communicate with due to low vision. It enhanced their professional and personal communication. From the responses of the participants, it can be concluded that technologies such as social networking websites, online forums, and Skype have immensely benefited the people suffering with low vision. However, some individuals will require more comprehensive training sessions than others to adjust to these technologies effectively. Regardless of vision loss, some individuals discussed feeling more confident about using any technology. Others wanted more training because of their adaption to vision loss and their lack of confidence in using technology.

Chapter 5 will move from the analysis of the interview data to summarizing the major findings from this study and discussing their implications for future research and practice. This next chapter will be framed by a discussion of the findings valuing each research question. This will lead to a reflection of the study's limitations and significance for the existing research and its implications for future use.

CHAPTER 5: Discussion, Conclusions, and Recomendations

The purpose of the chapter is to present a summary of the major findings followed by section that interprets them. The final chapter of the study is divided into two sections. The first section presents an overview of the participants of the interview. The second section discusses the findings of the interviews. The chapter also highlights the study's potential limitations and challenges confronted by the researcher. Moreover, it will discuss future implications of the study and the impact of social change.

Summary of the Findings

A change in mobility was identified as a main issue faced by the participants of the study. Because of their change in mobility, using technology was an acceptable issue in the adaption process to vision loss. Loss of mobility was the single most common issue that the participants listed when asked to describe the changes in their daily routine while adjusting to low vision. Additionally, most of the responses indicated that participants received little training when they contacted the Office of Vocational Rehabilitation in Pennsylvania. However, these trainings provided them benefits in various aspects of life. The training did provide knowledge about assistive technology aids in using social networking technology. In some instances, the assistive technology, in conjunction with social networking skills, makes staying connected easier.

The majority of the participants indicated that they found social networking websites to be an important source of communication with friends and family and members. Many of the participants stated that using Skype made them feel contented and more comfortable considering the issues discussed about losing some of their independence and reliance on others for transportation. In addition, some participants

described that learning websites were useful for finding resources relating to different fields Accordingly, many participants shop online more now than before their vision loss occurred. Two of the participants described online shopping as time effective, especially when public transportation is taken into account.

However, there are certain barriers associated with the utilization of these technologies. One of the barriers to using the technology devices was based on the word size of the instructions, and some were not able to get the instructions via voice. Another barrier described by many of the participants was the additional expense they have incurred to keep up with technology devices and applications. Although many applications are free or have a nominal cost, many new devices cost money, and the charges add up over time. The participants also considered the time it took to use and update software and applications to be a potential barrier. Some of the participants described a challenge when reading some of the information on websites. Not every website has contrasting colors or voice recognition.

The greatest challenge that the adults adjusting to low vision in this study have to cope with is the adjustment process to vision loss itself. It encompasses change; some of the changes seem to be easy transitions, while other changes require more thought. Mobility is a major component of the change described by the participants. Henry described being able to hire a driver, but this in itself was a timely process. In order to hire a driver, interviews had to be conducted. In our conversation, he described having to hire and fire a couple drivers. Trusting the driver was very important. Although he maintains some vision, he needs to be able to rely on the driver's integrity to get him where he needs to go and not to take advantage of the situation. After hiring a good

driver, and because he is confident in learning and using technology, he is able to continue to work.

Abbey is very enthusiastic about her online interactions and the ability to gather information for her career and her living situation, but she is less enthusiastic about her residential location. Getting around her area is not as easy as when she was younger with full vision. Now in her late thirties, Abbey doesn't like the hassle of waiting for bus transportation. Thus, there are many aspects of life that are different now than when the participants had full vision.

Several of the participants alluded to the fact that they do not know what it would have been like for them to live with low vision prior to digital technology, even prior to the telephone. Devices like the smart phone and laptop, through social websites, provide additional means of conversation and connections. However, not all of the participants moved immediately to adopt assistive technologies as a means of connection with others. Eight out of 10 of the participants purposefully used, continued to use, and adapted their use of technology. They seemed to relay the importance and benefits of technology for their situation. Two of the participants, Margaret and Alfred, were tentative about using newer technology, especially online sites, and needed prompting to use and adapt to newer technology. Accordingly, Barry also needed some prompting by a family member to use a social networking site.

Interpretation of the Findings

This section interprets the findings by providing a discussion of each research question. It provides commentary and examples from the perspective of the participants. The study is based on the interview of 10 individuals. There are four research questions.

Discussion of Research Question One:

Question one was a broad question that examined the changes in daily living of each individual. It investigated the ways that adults adapt to changes in their lives and to adjust to low vision. Two examples of lost leisure that arose from the interviews were scrapbooking and golf. Another concern raised by the participants was that they had to remain dependent within their own home. However, a majority of participants said that they look for alternative ways to adapt to the many issues, especially since for most of this sample population, regaining any vision is likely not possible. Thus, finding a way to continue daily living tasks through new means is better than feeling overly dependent on others.

The participants of the study described some changes in their social circles. Some participants had a change of friends due to the change in their vision. Adaption and adjustment is a continuous issue in the ability to relate to others. Joseph, the youngest participant, described how his friends from high school had distanced themselves from him. He felt this was due to his accident and his not being as mobile as he was prior to his vision loss. Abbey provided an alternative view and found old college friends and rekindled friendships through social networking sites like Facebook. As she described, she might have connected with these friends anyway because Facebook is everywhere, but she thinks she did it sooner because she enjoyed online communications more than she may have prior to vision loss. In addition to social connections, the majority of participants described the importance of maintaining employment. Many described the friends and support they have gained through their place of employment. Although all participants described some fear of losing their ability to work, Figure 7 shows that 70%

of the participants maintained active employment in their careers. However, 30% were unable to continue their previous career. Twenty percent added an adaption to mobility to continue working and feel more confident in their mobility.

Figure 7

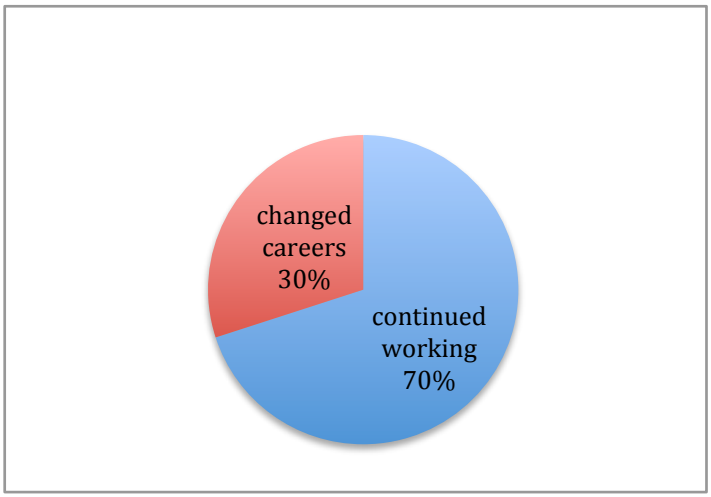

Figure 7: A pie chart showing change in employment by the participants in the study.

Most of the participants continued to work in their same career or employment setting (see Figure 7). They had to adapt to continue in their previous setting. The adaptions were based on schedule, and schedule was impacted by mobility. The participants described significant changes to their schedule. Changes were categorized broadly and displayed in Figure 8 below. The categorizations used include: no significant change; huge changes, such as leaving a job or retiring; relying on others for mobility; and how they socialized with other people. The participants noted that people suffering from low vision are often between dependence and independence in relationship to their performance in routine tasks.

Low vision increased the participants' dependence on others primarily since low vision limited their mobility. Due to decreased vision, individuals are not able to perform their daily routines without the assistance of either technologies or other individuals.

Detailed in Figure 8, nine of the participants indicated that decreased vision brings about social changes. They explained that individuals suffering from low vision often experience difficulties in face recognition. As a result, their social interactions are negatively impacted. It has been frequently noted that in order to prevent feelings of embarrassment, adults suffering from low vision often withdraw themselves from gatherings of large people.

Figure 8

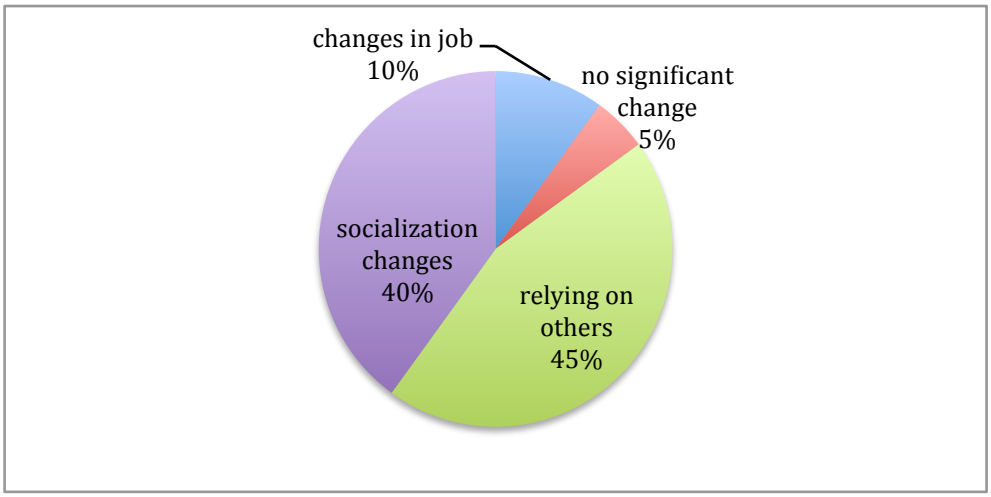

Figure 8: A pie chart showing changes in the participants' schedules.

The 8% of participants,who identified no significant changes in schedule represented the participant who maintained the most vision. Two of the individuals changed careers. The participants described the ability to stay at their job because they found ways to travel to work. This change might have shifted their independence from self to others.

Discussion of Research Question Two: Training

The main thread that developed from research question three was related to quantity and quality of training. The question asked: In what ways do adults perceive and understand the role of intervention training encompassing networking skills on living

with low vision? All respondents acknowledged that technology was very important to them. Technology was part of their careers, in their homes, and how they stay connected professionally, with families and friends. Through additional training, they were confident in their work place. However, some felt that more training was necessary. Nine of the ten participants added that voice technology was significant to their use of general technologies. Voice technology can be built into already existing technology, such as a smart phone. Iphones come with voice technology; the owner only needs to change a setting to enable it. Other times, voice applications must be installed or added to a device. In general, technology aided in their continued connections and provided a platform for learning or gaining information and joining groups with similar interests.

The participants described their prior training on a basis of time and amount. One participant described it "as a good review, but not anything new." However, another participant description explained that "times sure have changed; there is so much available." These descriptions represent Siemens' idea that "learning and knowledge is based on diverse opinions," as well as the thought that "learning is also a process that connects sources" (Siemens, 2008, p. 11). Individuals continue the learning process through making connections from each experience and digesting the diverse opinions within each experience.

Although the opinions of the participants about the training was diverse, one thing became relevant: that training was a part of a process that connected the individuals with people who could assist them in the future, or at minimum, to a group that shares information. Figure 9 shows that only 10 percent of the participants felt they received the maximum amount of training either needed or provided by the servicer. The phrase

"maximum amount of training" entails that the trainings programs provided includes enhanced rehabilitation services and adequate education about the strategies to cope with low vision. On the other hand, the term "minimal training" indicates that the training programs are not sufficient enough to meet all the demands of the trainees. Minimal training lacks the incorporation of adequate strategies to cope with low vision and enhanced rehabilitation services.

Figure 9

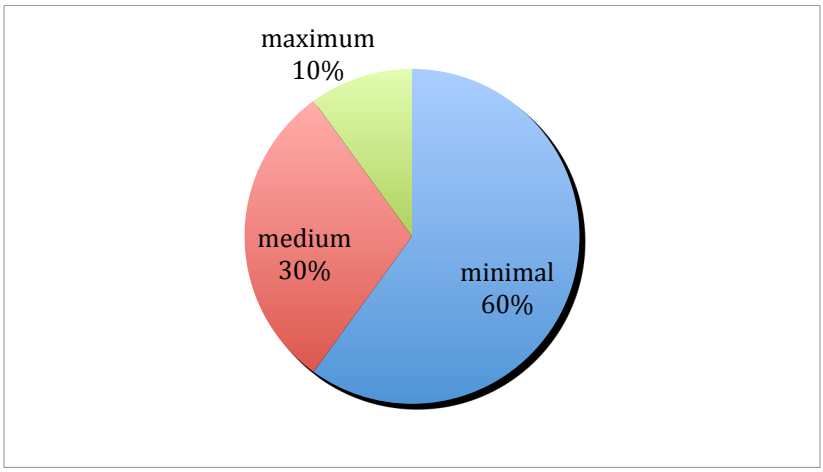

Figure 9: A pie chart displaying the amount of technology training by participants in the study.

An interview question under research question two was if the participants used technology daily. The answers ranged from absolutely they use technology everyday for many reasons, to just for education purposes or just for work. Eighty-eight percent used technology everyday, while 12 percent did not use it on a daily basis. Figure 10 displays how the participants used online networking, using phrases from their answers. A majority of the participants, representing 49 percent of the total sample, indicated that they utilized technology as a mode of communication. Technology such as social networking allowed them to interact with their friends and relatives. Thirty-one percent

of the participants described that they utilized technology for the purpose of document preparation. In addition, 8 percent of the participants explained that their main intention of using technology is training or education.

Figure 10

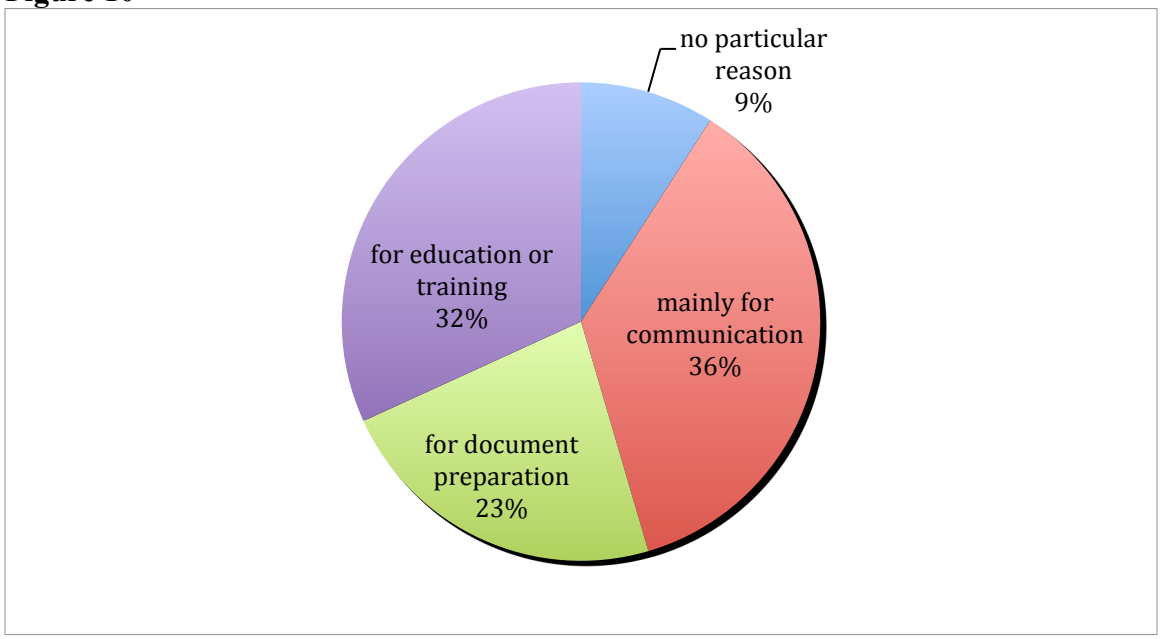

Figure 10: A pie chart displaying the use of technology by the participants of the study.

Discussion of Research Question Three

Research question three asked what the adults with late-in-life low vision perceive as barriers when using social networking. There were common threads between the participants on what constituted a barrier. The main barrier that appeared during the interview discussions was cost. However, cost was not limited to the purchase of a device, but purchasing of applications, and supplemental or peripheral devices. Alfred described his fixed salary and that he chose not to buy any of the applications available in the app stores. “If it is free and it has a good rating,” he might try an application.

Daniel seems to earn enough money to keep his technology current, but he also described how fast technology has changed. “It changes so fast, and my kids are always

wanting something new." Joseph also discussed cost. He uses assistive technology from his service provider and is glad because "there is no way I can afford that or would pay for it." Accordingly, Abbey likes to try new technology, but gets to try a lot of "new things" thanks to the information technology person at the school where she works. Her school has a one-to-one program in conjunction with an option for students to participate in classes via computer.

The issue of barriers led to an understanding of how each person dealt with what they considered to be a barrier. Several participants described the need to have an outside person help with program updates, finding and understanding new devices, and explaining some of the features of the updates. Some of the participants were not weary about trying new things. Again, Abbey is a great example, but she does have the connection of the technology department at her school. Margret, on the other hand, has some tech support at work, but only if she requests the assistance. Margret is more cautious of trying new things, she does not trust openly providing information online.

Discussion of Research Question Four

Question four queried about the benefits adults with late-in-life low vision perceive when using social networking. Social networking was found to be exceptionally beneficial for the individuals experiencing low vision. Current social networking, such as Skype and Facebook, integrate audio and video technologies within them. These technologies enhance the communication of the people with low-vision since they allow them to make audio or video calls to their friends and families. The benefits of technology overlapped throughout each respondent's discussions. There were themes throughout, yet here again it depended on the individual.

There were particular preferences for different situations specific to each individual. One main benefit was the speed and availability of information provided on the Internet. The use of social sites, shopping sites, professional groups, and learning opportunities would not be as accessible if it were not for the ease of use of the Internet. It is important to note what one participant said, "It is hard not to use and find good use of the Internet these days…it has benefits to me so I do not have to travel as far as much, but I think that is the same for lots of people."

All of the participants thought being able to the use the Internet was very useful; however, that does not mean it is always easy to understand or access. All of the respondents did use the Internet to research things, but they varied in their online searching activity. Six of the respondents were still connected to educational endeavors, and that constituted part of their research. The educational online connections were professional, personal interest, learning more about technology, and taking additional classes. Kyle talked about educational searching as the ability to learn from others in similar situations. Kyle mentioned connecting and starting groups that are for adults and individuals with low vision. Another interesting point was using the Internet for exposure. Daniel explained that exposure for his career, such as interest groups, was important to him. Some of this exposure was conducted through social networking sites.

The use of social networking sites does benefit people in staying connected to others. However, different sites are used for different presentations of self. One participant described being a different person on his Facebook site as opposed to the MySpace site he still utilized, and yet another presentation of self on LinkedIn. Facebook

represented his family and current friend set, the MySpace had his music connections, and LinkedIn was for career interests.

Although social networking sites allow people to stay connected, a couple of participants mentioned the importance of telephone communication and online meeting forums. Margret said the telephone, her landline, is still the best technology: She does not have to see anything, and she can hear the voices of her family. Figure 11, a column chart, shows the different sites the participants used. Again, most of the participants used more than one online forum. Figure 11 below illustrates the frequency of the most utilized websites. Facebook was found to be the most used social networking sites. Email was found to be the most used form of communication.

Skype service was utilized by six participants to communicate with friends, families and business colleagues. MySpace was the least utilized source of communication. In conclusion, it can be put forward that various social networking websites have brought significant changes in the way people with low vision interact with others. Before the emergence of these technologies, people with low vision confronted a range of difficulties while interacting with others. As a result, their social sphere was contracted. However, these technologies have enabled the people with low vision to enhance their existing relationships.

Figure 11

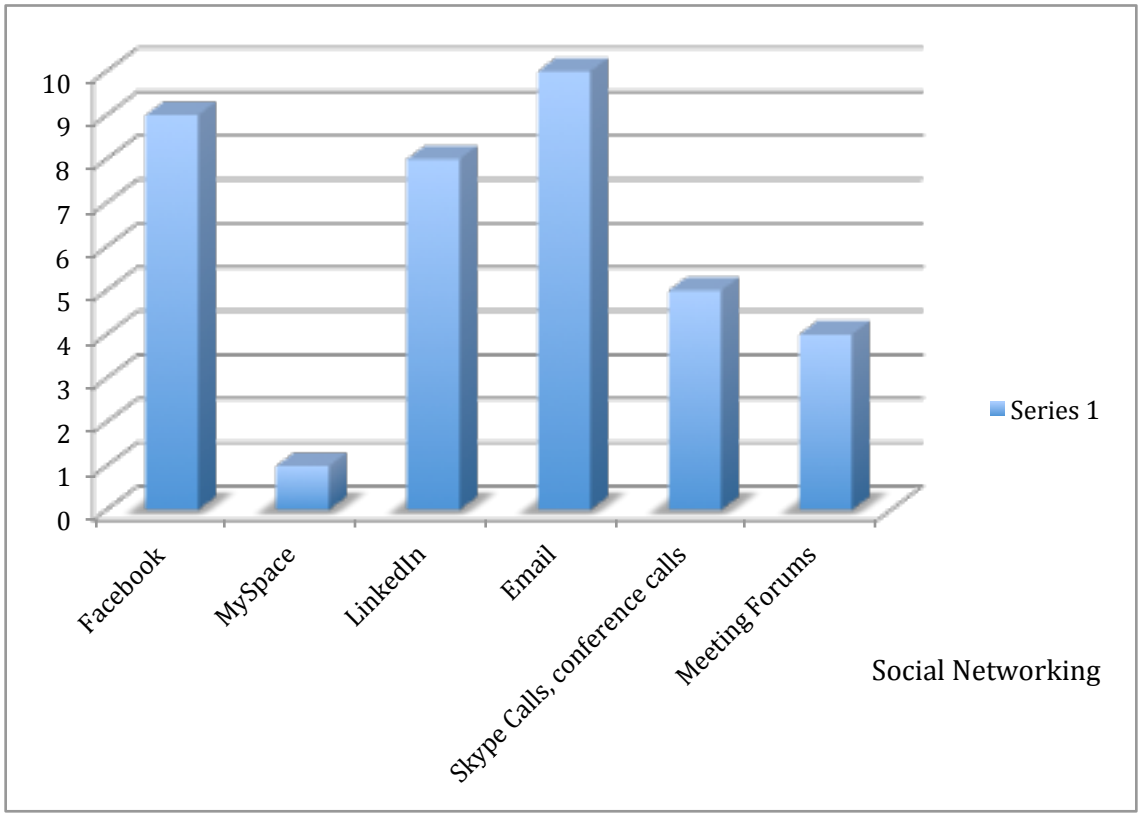

Figure 11: A bar chart displaying the most used social networking sites by study participants.

Limitations of the Study

The scope of the present study is limited to the United States of America because of the study's interest in the region and the accessibility of the research respondents. The United States holds one of the largest known numbers of adults diagnosed with late-in-life low vision (National Eye Institute, 2012). The population was purposefully selected as a sample of convenience that included adults who either had completed or were attending intervention courses provided by the state of Pennsylvania or a county program under the Rehabilitation Act. Adults formed the target population for the present study. Furthermore, the use of relevant literatures and statistical analysis aided in the present

study to understand the effects of social networking on adults adjusting to late-in-life low vision; thus, provided guidance on the choice of methodologies, data collections instruments, and process. Another limitation was the smaller sample size associated with the present study; however, it generates raw data from interviews, discussions, and participant journaling from the individuals who are adjusting to low vision and had completed some intervention. The conversations occurred mainly in person, a couple over the phone, and through mediums relevant and discussed in the study: online forums.

Reviews of previous studies were not used to further the research. This study is presented to "understand the nature and meaning of the experience" of the adults who are adjusting to low vision and their perception of technology in that process (Moustakas, 1994). The primary source of data is the analysis from reported experiences of the individuals recounted during the interview process, discussion, observation, and journaling.

Future Implications of Research

The findings of this study can act as a foundation for future researches that wish to carry out a research on a similar topic. The literature review of this study significantly enriches the literature on Connectivism theory for future researchers, especially as it relates to training and learning design for individuals with adult low vision. This study also contributes a body of information about the dignity and worthiness of the human experience with regard to the adjustments to low vision late in life. The study provides some information to individuals who might need to manage phases of depression during the adjustment process. The study promotes positive social change by providing insight from actual adults with low vision by communicating some of their experiences. The

experiences provided by the adults who participated in this study allow others in similar situations access to information about the possible and useful benefits of maintaining and making connections through technology. Furthermore, this research examined the uses and current trends in digital connectivity and networking opportunities and the possibilities that connectivity can provide adults with low vision. The findings of the study can be utilized by trainers working with adults with low vision. The review of the literature provided a lot of material on the range of emotions and issues related to adult adjustment to low vision. The findings will also enable others to understand their condition and the assistance that may be available to them. It shares experiences about the changes in tasks that were once considered routine, but with some changes are still manageable. In addition, the service providers of adults with low vision can utilize the findings.

By sharing experiences about the changes in daily tasks that were once considered routine, ideas can be disseminated so understanding that the changes are manageable. Moreover, the sharing of experiences demonstrates that individuals with low vision do not have to go through the adjustment process alone and have opportunities to connect when feelings of isolation might occur. This research builds or resonates with the many studies that explore online social networking and online connections. It strengthens the basis for the modern theory of Connectivism that identifies the need and ability for individuals to learn and connect from anywhere. The importance of online access included learning and encouraging the ability to share information and knowledge. Specifically related to this study, the ability to learn and adapt to low or decreased vision while using social networking is a means of staying connected to others. The ability to

stay connected to other individuals that were part of a their social, educational, and professional community is important. This study specifically takes into consideration a population of people that can benefit from the ease of connecting digitally while maintaining relations that provide a sense of self and identity as they adjust to a difference in sensory ability. The change in sensory ability affects daily living, but connections can aid in maintaining a sense of self. This maintenance of self has the ability to maintain a quality of life.

Recommendations for Future Research

The literature presented in the review of literature did not provide a great depth of information about using general technologies. This study's specific population of adults who are adjusting to vision loss provides a platform for continued investigation of adults and youth who are living with vision loss and maintaining a quality of life through relational online connections. Future researches can examine these topics as well as the risks that might occur with online connections. The barriers to adjustment highlighted by the researcher in the literature review section can act as a guide for the future researcher who aims to diminish these barriers. The availability of training through an intervention program is important. However, a key component that came from the discussion was that individuals do not need a one-size-fits-all model to their technology training. If programs were to continue to study how to positively impact training, it might be better to pinpoint a couple skills or online advances that are widely used and accepted and how they can be used in the home or work place of an adult with low vision.

The action research of this study is limited to qualitative research design; future studies can employ quantitative research design that could further explore the lifestyles of

the individuals. It would be interesting to know the number of adults with low vision using online connections to work from home. Stemming from this, and since 21st century learning was identified, what is the impact on youth with vision loss and their education settings? Refining and narrowing information, such as marriage and living arrangements, may help community programs that deal with assisted living. Accessibility to health care services was not addressed in this study. This topic has been addressed in many articles, but what is the impact now and how is online access impacting access to healthcare? Future researches can study the accessibility to health care services, including location of therapists, doctors, and clinics, plus how patients reach these locations. This could provide insight on the determining factors for individuals with low vision or any number of conditions to choose health care providers. It would be worthwhile to incorporate overall health status, including physical health and mental health and how conditions such as depression relate to low vision.

Reflection

The study was important to me because my husband and our family is adjusting to low vision. I have been observing my husband, myself, and our family as we repositioned ourselves in the evolving process of adapting to daily living with his vision loss. My prior teaching experience as a general curriculum and special education teacher provided strength and knowledge in some of our endeavors. We were open to learning and adapting with information we gathered ourselves and through his vision and training specialists. This situation allowed me to pursue our interest in a continued quality of life, while learning about the adjustment process of adult onset vision loss. The combination

of a background in education and the desire to move forward in a positive manner was a major contributor in pursuing this study.

However, it was equally important to stand back and listen to the responses of the 10 participants, find the patterns and differences, and describe them in the study from the perspective of each participant. Most of the participants were very willing to participate in the interview process. They shared openly when answering the questions. This group of adults appears to accept their vision loss and has adjusted to their current life. Joseph, the youngest, has adjusted, but he reflected more than the others about the loss of friends. He also talked about becoming friends with people from high school he did not think he would have been friends with during his high school years. Margaret did share after the interview and our meeting that she was apprehensive about doing the interview.

The study provided a look at the universal commonality of responses from the participants, especially on the two questions based on barriers and benefits of using general technology in daily life. Although the details diverted in direction of what constituted a barrier or benefit, all of the participants spoke to the issue of cost and time when dealing with technology. Again, all the participants agreed that online connections were one of the easiest forms of communication and means of staying connected.

The study did not provide a sense that the technological connection replaced the face-to-face interaction, but they are different and both meaningful. The circumstance seems to influence the type of interaction. The digital connection has been helpful for time and space, but as Abbey, Margaret, Barry, and others described, they do miss being able to hop in their car and visit somebody. Yet the ability to learn and use digital connections such as Facebook with voice, kept them updated with what was going on in

their family and parts of their community. This, as described by Alfred, aids in his continued "feeling as part of a community." The community may look different, but there are connections. He also described that being a part of the community is why he volunteers even after retirement.

Closing

Social networking is not new; it is now widely used and relied upon. However, participants of this study recognized the impact of connections made online, and the importance of these connections to them because of their change in lifestyle. This change in lifestyle impacts the participants' work, their sense of belonging to a group, and their ability to access information. Connections are meaningful even if they are not face-to-face. Connections made over a digital form provide these individuals adjusting to vision loss access to information and groups or communities that provide meaning to their lives.

This study embraced the idea that learning is a lifelong process and that education or interventions and training can be helpful to adults adjusting to low vision. Although the participants of this study did not need or require the same levels of training concerning technology, all of the participants agreed that they were glad they were able to contact an agency and be provided some skill review for using technology. Agencies have the opportunity to reflect on this study and recognize that individuals with low vision may not require the same traditional approach to training, but training based individual needs that will provide confidence in using and accessing technology and social networking.

In the beginning of this study, it appeared that reaching individuals to participate in this study and tell their story was going to be very difficult. However, once a couple

people contacted me and we chatted on the telephone about the goals of the study, they were exceptionally helpful and wanted to refer friends. One participant commented on the idea of connections. Once you become connected with a person with low vision, it is amazing how many more people you meet in the similar situation. There are communities – both online and meeting in brick and mortar buildings – that bring similarly situated people together. Since my husband and our family is adjusting to low vision, there were many commonalities to our situation and the situations of the participants of the study. However, there is always a concept or outcome that the researcher does not intend. One of these was the discussion about Cloud storage. It was a topic that was not considered when writing and reviewing the interview questions. In addition, there were several other thoughts and concerns discussed throughout that might be applied in our household. We understood many of the comments discussed in this study. However, it is true that once you have a change in lifestyle, you often meet members of a similar community. That was not the case in our situation, and this study aided in our connections with other adults with low vision. Perhaps we do not participate as much as we should with groups of commonalities; thus, I did not find participants based on our connection with low vision. Again, once the interviewing began, I had to separate my preconceived perceptions from what the individual was describing as his or her experience. However, there were similarities and differences. Accordingly, there were moments of realizing I was getting good information for our family's adjustment as well.

Hopefully, these study findings can prompt improved training of adults with low vision that can make significant improvements to their lives. Additionally, the findings can act as guide for the individuals who assist people with vision loss. The findings can

bring about significant understanding and renovation in the usage of social networking among individuals with vision loss.

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APPENDICES

Appendix A: Consent Form

You are invited to take part in a research study of the perceptions of adults with low vision and the use of general technology to make and maintain connections. The researcher is inviting you to be part of the study because you have been diagnosed with low vision, or legally blind, but maintain some vision, and have completed an intervention that encompassed some general technology to use in maintaining or making connections. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

An investigator named Deborah Forest, who is a doctoral student at Walden University, is conducting this study.

Background Information: The purpose of this study is to collect narratives from interviews and discussions of the perceptions of individuals who have been diagnosed with low vision and who have completed an intervention process that encompassed some general technology training. The purpose is to gain understanding of the experiences of these individuals using general technology and their adjustment to low vision.

Procedures: If you agree to be in this study, you will be asked to answer questions prepared by the investigator. You will be asked to engage in recorded communication honestly about your lived experience. At a later date, you will be asked to read through the transcripts to make sure correct synthesis of the conversations were prepared. The interviews will be audiotaped. The consent form must be signed in order for the in order for the research to be conducted.

Voluntary Nature of the Study: Your participation in this study is voluntary. This means that I will respect your decision of whether or not you want to be in the study. No one will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind during the study. If you feel stressed during the study you may stop at any time. You may skip any questions that you feel are too personal.

Risks and Benefits of Being in the Study: Participation is voluntary and at any time during the participation in study, you may terminate your participation at any time. You may refuse to answer any questions. The benefits of participation may be increased understanding for yourself and other individuals who are, have, or will experience adjusting to low vision while trying to maintain and make connections with family, socially, and economically.

Compensation: None

Privacy: Any information you provide will be kept anonymous. The researcher will not use your personal information for any purposes outside of this research project. In Addition, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure by cabinet lock and key and destroyed in 5 years, as required by the university.

Contacts and Questions: You may ask any questions you have now. Alternatively, if you have questions later, you may contact the researcher via 717-476-6625 or Deborah.forest@waldenu.edu. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 1-800-925-3368, extension 1210.

Walden University's approval number for this study 04-30-13-0039447 and it expires on April 29, 2014.

The researcher will provide you a copy of this consent document to maintain for you use.

Statement of Consent: I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I am agreeing to the terms described above.

Printed Name of Participant

Date of consent

Participant's Written or Electronic* Signature

Investigator's Written or Electronic* Signature

The Uniform Electronic Transactions Act regulates electronic signatures. Legally, an "electronic signature" can be the person's typed name, their email address, or any other identifying marker. An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically.

Appendix B: Letter to Participants

Dear _____,

I am a doctoral candidate in the Department of Education at Walden University. I am pursuing my dissertation topic _____The purpose of my study is to understand and describe _____. Your participation is requested because you have been diagnosed with low vision, and you have completed an intervention that encompasses some general technology strategies.

Participating in the study will require approximately _____ hour in-depth interviews. The interviews will, with your permission, be audio recorded and transcribed. To maintain confidentiality, you will not be identified by name on the recordings, the transcriptions, or the journaling. The data collection devices will be kept in a locked cabinet in my house.

In addition, you may be asked to share any relevant documents or digital artifacts, which will also remain confidential.

Thank you in advance for your participation.

Sincerely,

Deborah Forest

Appendix C: Interview Guide

Guiding Research Questions

Research Questions

1. In what ways do adults describe changes in their life and adjusting to low vision?
2. In what ways do adults perceive and understand the role of intervention training with computer skills that encompass online social networking and living with low vision?
3. What do the adults with late-in-life low vision perceive as barriers when using online social networking?
4. What benefits do adults with late-in-life low vision perceive when using online social networking?

Interview Question Guide

1. Describe the changes in your daily routine as you adjust to decreased vision.
2. What do you consider significant changes in your schedule since the decrease in vision?
3. Please describe any technology training that you attended as part of an intervention received since the decrease in vision.
4. Do you use technology daily?
5. How are you using technologies now?
6. Are you using social networking sites?
7. Which Social Networking sites are you using?
8. Are you currently using technology to maintain connections with others?
9. What types of connections are you maintaining or making through technology?

10. Please describe any challenges you have when using technology?

11. What might discourage you from continuing to use technology?

12. What are some of the benefits from using technology?

Possible Probes

- Please tell me more about
- Could you share an example

Appendix D: Journal Guide

Hello, please use the journals provided to reflect about your use of technology in your daily routine during this time until the journal is collected. Please use these questions as prompts or guides to focus on the topic of the study. Thank you

1. What types of technology or digital communication device are you using? Examples: laptop, smartphone, tablet
2. Where are you using the technology? Home, library, work
3. Did you have any difficulties using technology today? please describe
4. What, if anything, discourages you from using technology?
5. How the connections are made using technology?
    - Facebook
    - Email
    - Blogs
    - Websites?
6. What other forms of communication are you participating in using technology?
7. Please describe the types of connections you are making, such as family, work, and/or, community.
8. Are there any differences in the level of human connections since the decreased vision?

Possible Question Probes

- Please describe more about
- Could you share an example of