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Mobile Technology Use and Developmental/ Intellectual Disabilities

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By

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MSW Clinical Research Project

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The Clinical Research Project is a graduation requirement for MSW students at St. Catherine University/University of St. Thomas School of Social Work in St. Paul, Minnesota and is conducted within a nine-month time frame to demonstrate facility with basic social research methods. Students must independently conceptualize a research problem, formulate a research design that is approved by a research committee and the university Institutional Review Board, implement the project, and publicly present the findings of the study. This project is neither a Master's thesis nor a dissertation.

Abstract

The purpose of this research project was to gain insight into the impact of mobile technology use among individuals with developmental/intellectual disabilities (DD/ID). Individuals with DD/ID are engaging in their communities and society more now than ever before and are using mobile technology as a mode to make it possible. The study's research revolved around the experiences of professionals who work closest with individuals with DD/ID, which provided valuable, first-hand insight into the impact of mobile technology. This study also helps provide information on a topic that has relatively limited available research. One of the strongest themes in this study was how the use of mobile technology among individuals with DD/ID helps increase their connectedness to the communities and societies in which they participate. Increased connectedness ultimately leads to a reduction of stigma and increases awareness about what it means to live with a DD/ID. Increased was also described as a method for individuals with DD/ID to advocate on their own behalf, and urge for better disability programs, policies, and services. Overall, information gathered through this study indicated that mobile technology appears to positively impact the quality of life of individuals with DD/ID, by increasing independence, self-determination, and community connectedness. The limitations of this research, along with recommendations for future researchers are also included in this study.

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Introduction

Kevin arrives home from his adult day program at 3pm. Once he gets home, he pulls out his iPad and scrolls through his apps to find "Facetime." Kevin opens the app and selects his mother from his contact list. Within seconds, Kevin is connecting to his mother's iPad she has at her home. Kevin answers and a videoconference is initiated. Kevin checks in with his mother and lets her know that he has arrived home safely and is doing well. Kevin discusses his day with her and what his plans are for the rest of the night, including that he will check in with her when he takes his evening pills and makes his dinner. Kevin's mother is able to observe that Kevin has taken his medications as prescribed and prepares food in a safe and appropriate manner. The technology available to Kevin through use of an iPad has allowed him to live in his own apartment, something that was once considered impossible. Kevin has Down syndrome and has some functional limitations but, with some support he is able to manage living independently. Kevin lived with his parents for many years, before transitioning into a residential group home when his age reached the mid-thirties. Kevin had a difficult experience and wanted to move back home with his parents; however, his parents did not think it would be a good idea, as they were getting older and felt Kevin may soon be faced by life without them. The ability for Kevin to move into his own apartment with his parents being able to help provide supervision remotely, was paramount in the decision to have Kevin move into an independent setting, and allowing him live as he desires (Scott Muer, Personal Communication, 2014).

Developmental disabilities and intellectual disabilities (DD/ID) can cause difficulties across numerous areas of functioning, especially in language, mobility, learning, and self-preservation, and independent living. The most common DD/ID have been identified as the following: Down syndrome, Cerebral Palsy, Mental Retardation/Intellectual Disability, Fetal

Alcohol Spectrum Disorders, Fragile X Syndrome, Autism, and Epilepsy. A DD/ID is a term used to describe a permanent health-related condition that limits an individual ability to function in a mental or physical capacity (Boyle et al., 2011). The following definition of developmental disabilities is provided by the Centers for Disease Control and Prevention (CDC), describing developmental disabilities as:

A limitation that is developed by an individual before twenty-two years of age, which constitutes a substantial disability to the affected individual, and is attributable to mental retardation or related conditions which include cerebral palsy, epilepsy, autism or other neurological conditions when such conditions result in impairment of general intellectual functioning or adaptive behavior similar to that of a person with mental retardation. (CDC, 2014, para. 5).

Also, individuals who have an intelligence quotient below 70, may be diagnosed with mental retardation, which is also considered to be a DD/ID. Signs and symptoms of a DD/ID can present demonstrated in a variety of fashions, with the same DD/ID impacted an individual uniquely (CDC, 2014).

The population of individuals with DD/ID has continuously risen over the past decade. Data from a survey conducted by the CDC from 2006-2008, indicates that about 1 in 6 children are born with a DD/ID. However, there are conflicting reports regarding these figures, as census reports are not completely accurate, but it is estimated that anywhere between 4.6 million to 7.7 million people have a DD/ID. This study also noted an increase in the occurrence of children born with DD/ID, as the population grew by 17.1% from 1997 to 2008 (Bethesda, 2014). Although this is expected to change due to greater research into what causes specific DD/ID, individuals with DD/ID are living longer and participating in the community more than ever. The

increased participation in community activities increases the need for more integrated person-centered specialized services for people with developmental disabilities (Boyle et al., 2011).

Over the past half century, there have been many changes to the support offered to individuals with DD/ID and their families. In the mid-twentieth century, individuals and their families were presented with numerous hardships, including minimal supportive services, social disgrace, and little knowledge of DD/ID, which often led to individuals with DD/ID having to live in state operated institutions. Many of these institutions were often given less than adequate funding, which resulted in these individuals being underserved and forced to live in intolerable conditions. Abuse and neglect were common occurrences in many institutions (Pollack, 2011). As knowledge of maltreatment surfaced, and more information identified about DD/ID was obtained, families and community members began to call for action. As a result, many local and national groups were created to advocate for better rights, services, and overall treatment for individuals with DD/ID. Eventually, through continued advocacy, these groups helped secure formal funding through federal subsidies and the Social Security Administration, which was used for individuals with DD/ID to put towards living and services (Arc of Minnesota, 2014). Funding streams included the Disabled Children Program established in 1956, the Education for Mentally Retarded Children Act of 1958, and Supplemental Security Income in 1975 (Pollack, 2011).

Positive changes for individuals with DD/ID continued to occur with the development of Medicaid and its expansive role of payer for services for those with disabilities. Medicaid developed into a source of funding for individuals with DD/ID to use for medical, long-term care, and education services. In addition to these services, Medicaid began to fund home and community based services, which allowed many individuals with DD/ID to access necessary services outside of institutional settings. Home and community based services being offered to

individuals with DD/ID was a turning point in the population's quality of life, as it provided for greater opportunities and experiences in a less restrictive environment. With the enactment of the Americans with Disabilities Act in 1990, further advancement ensued. The Americans with Disabilities Act seeks to promote inclusion of individuals with DD/ID, and allows for each to exercise more self-determination in deciding how and where they live their lives (Pollack, 2011).

Today, DD/ID has become much more acceptable in our society. As previously stated, over the past fifty years there has been a movement to deinstitutionalize individuals with DD/ID and get the population integrated into the community. Individuals with DD/ID have been given more choice regarding their living situation, and many have opted to reside in more residential settings (Pollack, 2011).This movement has helped normalize DD/ID and has caused public perceptions to shift positively. Once thought of as a burden to society, individuals with developmental disabilities are now participating in community, and contributing to society in larger numbers and more ventures than ever before. In turn, this movement has improved services offered to help support individuals with DD/ID in many different capacities (Pollack, 2011). Often times, the key to the success of individuals with DD/ID are strongly linked to the supports they utilize and whether or not an individual's strengths and needs are considered when they are matched. As individuals with DD/ID are participating in increasing amounts of activities, they have begun to experience more forms of technology (Douglass, Wojcik & Thompson, 2012).

Along with improvements in ideologies and information about DD/ID, similar transitions have been made in regards to technology. Advancements in technology have had an immeasurable impact on societies across the world. From the early days of our world, advancements in technology have generally made life easier and allowed us to reach new heights

by being more productive and allowing us to meet our own needs more efficiently. In recent years, we have experienced great technological advancement in a short period of time. There have been many innovations, from the internet, to the smart cell phone, to social media, technology has grown to impact even the smallest part of everyday life. Similar experiences are had by the population of developmental disabilities. For the sake of this qualitative research project, mobile technology has been identified as any iPads and tablets, iPod Touch, E-readers and Smart Phones, used to assist the user in some regard. Studies conducted by Pew Research (2014) indicate that the use of mobile technology is widespread across American society. Their research exhibits that among American adults, 58% own a smart phone, 32% own an e-reader and 42% own a tablet and or iPad. Ownership has increased greatly over the past decade. In 2009, smartphone ownership was at 35%, which indicates a 23% increase in ownership during that time. With the introduction of iPads, tablets, and e-readers occurring after smartphones, statistics began being gathered in 2009, when each had 3% ownership. Ownership of these items increased immensely, with iPads and tablets increasing ownership by 39% to a total of 42%, and e-readers increasing by 29% to a total of 32%. The category of mobile technology that experiences most ownership is smartphones. Pew Research Center reviewed common uses of smartphones, which included, 52% of owners used email services, 50% downloaded applications, and 81% used text messaging. These numbers indicate that as a society, mobile technology is a part of an increasing number of our lives, and its use varies (Pew Research, 2014).

Technological advancement has also had a large impact on the lives of those with DD/ID. Even individuals with DD/ID that have a profound or severe DD/ID have been able to utilize technology, and received therapeutic benefits. Individuals with DD/ID who have complex

behaviors and limitations have also experienced a reduction in negative impacts from their

DD/ID because of the support of technology. The use of mobile technology can help support,

physical, mental, and social needs of those with DD/ID (Bryant, 2011). Mobile technology has

become common among individuals without DD/ID, which has allowed for greater, easier access

to devices for individuals with DD/ID. The increased versatility and relative ease of use of these

devices has allowed for mobile technology to be very practical for use among individuals with

DD/ID. Bradshaw (2013) indicates that the low cost of iPads, iPhones, and iPods allow them to

be effective forms of assistive technology to individuals with DD/ID. The multiple functions and

relatively low-comparable cost of other technologies or devices that has a similar purpose, makes

mobile technology a very valuable resource. The ability for mobile technology to address

countless areas of daily living through a single device, makes it helpful in promoting community

integration, independence, and self-determination (Douglass, Wojcik & Thompson, 2012).

The purpose of this research project is to gain insight into the impact of mobile

technology use among individuals with DD/ID. In order to accomplish this goal, this researcher

will interview residential program managers, who support individuals with DD/ID in residential

settings and whom have experience helping identify, secure, and implement mobile technology.

This study was used as an exploratory study to analyze these individuals' experiences with

mobile technology and the impact it has on the individuals with DD/ID they support. The

increases in technological innovation as well as a steady rise in number of individuals with

DD/ID participating in community, makes analyzing the impact of mobile technology on this

demographic, an important next step for the field of social work.

Review of Literature

The review of literature has indicated that there are numerous areas of study that relate to how mobile technology impacts the lives of individuals with DD/ID. The areas identified by the researcher for preexisting literature included Technology and DD/ID, types of mobile technology being used, iPads, negative effects, matching person to mobile technology, access to mobile technology, applications, uses of apps, prevalence of social work with individuals with DD/ID application of technology to specific technology, mobile technology, professional role in response to work with DD/ID, self-determination and gaps in literature. The topics are explored to provide evidence of relevancy of the topics to this research study, as well as each respective topic's importance to understanding the overall shaping of the results of this research study.

Technology and DD/ID

Technology has been shown to be able to improve the lives of individuals with DD/ID. Technology has impacted numerous individuals within this population, from individuals with DD/ID who are high functioning, to those who have severe and complex disabilities that require very specialized supports. Combining technology with education and training has displayed that technology is positively impacting the lives of many with DD/ID in numerous faucets. Due its versatility, technology can help meet the physical, mental, and social needs of those with DD/ID (Lancioni, O'Reily, Sigafoos, Singh, 2013). According to the 2010 census, there are nearly 5 million people living with a DD/ID. These individuals are faced with barriers that limit their capacity to function. Individuals with disabilities can use technology, whether it is specific, specialized, or general to their disability, to help them overcome their disability and be more independent people (Carey, Friedman, & Bryant, 2005) (Bryant, Seok, & Ok, 2012).

Research indicates that there are many positives incorporated with the use of mobile technology on the lives of individuals with DD/ID; however, there can also be unintended negative effects. A mobile technological intervention may be seen as a positive effect on an individual, but it may bring negative effects for the individual's greater environment. Potential negative effects may include added stress, change in caregiver roles, and disruption of routines. Mobile technology might become problematic when tradeoffs are needed to be made for positive benefits for the individual versus the quality of life factors for the individual's greater environment (Bryant, Seok, & Ok, 2012). The need for examining the effects of mobile technology on the environment as a whole, including family, service providers, peers, and providing them adequate information about mobile technology, is essential in ensuring the individual utilizing the technology will reap the greatest benefits. Evaluating the potential impact of utilizing technology on the elements present in the individual's life is a critical component of successful implementation (Scherer, 2002).

Types of Mobile Technology

As indicated above, there has been a shift from the perspective of providing individuals with DD/ID the bear minimum of goods and services to maintain basic health and safety, to providing necessary supports that help promote a more enhanced life experience. This perspective has also changed in regards to technologies, and more closely mobile technology. Over the past decade, technological advancements has made a shift from being limited to addressing the medical or physical needs of an individual, to now providing for individuals to use it to address social and leisure needs. This new approach is one that puts as much emphasis on using this technology to achieving desired life goals, as it does related to meeting basic health and safety needs. Research suggests that individuals with DD/ID respond better to technology it

is used to achieve short term goals and gratification, as well as in a capacity that helps address areas that are important to them. The ability to address areas that the individual wants often leads to an improved quality of life (Scherer, 2012). A study completed by Bryant, Seok, and Ok, (2012) reviewed and evaluated the current trends in technology use among individuals with DD/ID. The study used a survey that yielded results showing that the most widespread type of technology used by a group of 200 individuals was among mobile technology, which helped to address social outcomes in a community setting. Study results yielded that participants reported using mobile technology that helped them participate in social activities such as communicating in groups and using technology to help facilitate exercise classes with peers. When asked about the most common uses of mobile technology respondents noted promoted socialization remotely, including computers, internet and electronic organizers, online interactions and email correspondence, apps that help maintain their independence, online games and activities, and interactive video. The most common uses of mobile technology were seen in categories related to community living or socialization (Bryant, Seok, & Ok, 2012).

Uses of iPads

In an article published in the Times Colonist, a newspaper in British Columbia, Canada, evaluated the impact of iPad use among individuals with DD/ID. The article states that woman living in a group home, who were often resistant to completing daily routines, became responsive once presented with an iPad. The article states that "the effect was immediate" and individuals who struggle with fine motor skills and could not write and draw, were able to do so using the iPads (Kines, 2013). The article continued by explaining that iPads allowed individuals greater use of the internet and ability to access current events, and play games, which improve their moods. One individual interviewed in the article stated, "When I'm down and depressed, that

helps me lift myself back up again" (Kines, 2013). Other individuals use iPads to help provide a

visual representation of their daily schedule, which seems to help reduce their anxiety about the

day's activities. The article summarized the use and impact of iPad among individuals with

DD/ID as a method for opening up their worlds and leveling the playing field in relation to their

disability. The article concluded by stating that staff that support these individuals hope future

mobile technology will have an increasing impact on these individuals' lives, and that

innovations will continue to allow them to have bigger presence in the world (Kines, 2013).

Negative Affects

        With the barriers removed through use of mobile technology, many individuals with

DD/ID are experiencing life more like they would if they did not have a disability. At the same

time, some technology has caused greater difficulties for individuals with DD/ID. For instance,

an individual with a DD/ID that has difficulty hearing, may be further marginalized when trying

to function in a society that is based upon using cell phones as a primary form of communication.

Another example is how individuals with DD/ID who have problems with vision are limited by

the widespread use of email or cell phone texting based communication devices, such as mobile

technology. These individuals are not able to connect, socialize, or share information, as they are

physically unable to use this form of communication, which can significantly limit their ability to

function. The same limitations can be applied to individuals with DD/ID who may have

difficulty with the ability to verbally communicate or use fine motor skills. These examples of

situations where individuals with DD/ID are limited due to the constraints society has established

through the use of technology, can also be further exacerbated when mental or cognitive

limitations are also present. As noted above, some technological advancement has been a

detriment to individuals with DD/ID, as a given disability may limit their ability to engage in

arenas of society, such as mobile technology, that have new, higher standards for participation. There seems to be obvious benefits to the innovation of technology paired with DD/ID, but there are also some unintended impacts of certain populations about which society should be mindful (Wise, 2012).

Matching Person to Technology Appropriately

The purpose of implementing technology in the lives of individuals with DD/ID is to assist with meeting the needs, goals, and outcomes that individuals with DD/ID may have difficulty meeting on their own. An important aspect of implementing technology for individuals with DD/ID is to ensure that the technology implemented is designed to properly address the individual's identified area of need. It is essential to ensure that technology is matched to meet individual's abilities, specific environment, and desired personal outcomes, in attempt to enhance their overall functioning. An emphasis needs to be the ability to continuously evaluate how DD/ID are being interpreted and the societal response to developing adequate delivery systems of technology to meet both the needs of this changing population and constant technological innovation. There is a worthy element of balancing social interaction with others, having services facilitated mainly through use of technology, and the need to ensure the individual is connected to the best technological supports, is of the utmost importance (Bryant, Seok, & Ok, 2012).

Access to Mobile Technology

In American history, there have been countless barriers that individuals with disabilities have had to overcome in order to gain a more normalized existence. This is no different for accessing technology. Through years of advocating, individuals with DD/ID successfully pushed congress to pass the Assistive Technology Act in 1988, which was reauthorized in 1994, 1998, 2004, and 2010. The goal of the Assistive Technology Act is to promote awareness of, and

access to, assistive technology devices and services. The Act attempts to provide persons with

disabilities assistive technology, so they can more fully participate in education, employment,

and daily activities on a playing field that is at the level of their peers and members of their

communities. This Act includes individuals with disabilities of all ages, all disabilities, in all

environments. Although this act is in place, there is still considerable difficulty for individuals to

access technology (Center for Parent Information and Resources, 2014). The Assistive

Technology Act has provided the following definition for a assistive technology, " that any piece

of equipment, or product system, whether acquired commercially or off the shelf, modified, or

customized, that is used to increase, maintain, or improve functional capabilities of individuals

with disabilities" (The Assistive Technology Act of 1998, 2004, Section 3, Findings 3).

Typically, when any technology is used by an individual with a DD/ID, it is often used to try to

increase, maintain, or improving their functioning capabilities, so it could be argued that this

technology is assistive technology. If society and funding mechanisms looked at technology

through this lens, mobile technology that might be more commonly used by populations without

DD/ID, these items might become increasingly available and accessible to individuals with

DD/ID (Bryant, 2011).

Over the past twenty years, there have been extraordinary advancements in technological

innovation. These have impacted our views on efficiency and the purpose of the intervention.

Our ideas about effectiveness have changed also. The way we evaluate the effectiveness of an

intervention must adapt to the different outcomes and improvement in function of from these

new innovations (Wise, 2012). The efficacy of an intervention is strongly correlated with access.

For example, the internet has revolutionized our society, and has become more and more

accessible to people all over the world. Access to the internet will continue to grow with its

increasing integration into societies and cultures throughput the world (Talukdar & Gauri, 2011).

The more effective the technological intervention is, the more likely there will be greater access

to it. This is indiscriminate of it being high or low tech, or even the cost associated (Wise, 2012).

In a study completed by Bryant, Seok, & Ok (2012) using a survey to ask individuals with

DD/ID about use of technology, data collected revealed that over 50% of survey participants did

not use any technological devices. Participants expanded upon the lack of use, indicating that the

reason they did not use electronic computer technology was due to lack of access. The three

common barriers to accessing technology included, lack of funding for devices, insufficient

training for service providers, and inadequate matching of technology to person. Participants also

expressed that even without the presence of these barriers, the eligibility criteria, application

requirements, and lengthy wait time involved to receive the technology, makes accessing

necessary technology very difficult. Lack of access was the main reason cited for individuals

with DD/ID not using technology (Bryant, Seok, & Ok, 2012).

Applications

There have been many recent technological developments that have helped improve the

lives of individuals with disabilities. Mobile technology devices has provided many new

methods that have transformed the way this population lives their lives. One study completed by

Kagohara et al. (2013) indicates that there have been many applications developed for

individuals with DD/ID, to address many of areas in which they may need support. The study

identified the following as areas that were most commonly addressed: academics,

communication, employment, leisure, and transitioning skills (Kagohara et al., 2013). An

example of an app that helps support academics is called "First Then Visual Schedule." This app

is used on an iPad or iPhone, and allows a schedule of events with corresponding descriptive

pictures and audio to be entered in a particular order and or at specific times. When the sequence

is initiated or the time of an event occurs the app prompts the individual using the audio and

visual cues to complete the given task or act as a reminder to engage in the designated activity

(Accessible Technology Coalition, 2014).

Uses of Apps

There are numerous apps that have been developed for use across nearly every domain

imaginable. Apps have been adapted to meet the various evolving needs of users. In a study

conducted by Douglass, Wojcik, & Thompson (2012), 508 apps were available on Apple iPads,

iPhones, and iTouch, which were identified as being developed for use among children with

DD/ID age five to sixteen, which aimed to help support a child achieve one of seven supportive

domains. The domains that were identified as important areas of support included the following:

home life activities, community and neighborhood activities, school participation, school

learning, health and safety, social, and advocacy. Many of these apps were able to address more

than just one of these domains. The study indicated that nearly all of the apps could help support

multiple domains, with many of them addressing numerous. The study expressed that the ability

for mobile technology devices to have the capacity to maintain a large amount of apps, can allow

for users to keep numerous apps stored on a single device. The ability for a user to access these

important apps by using one device instead of having to use different devices, which only offer

singular purposes, offers a greater number of supports to be available at the touch of a finger.

Combining mobile technology with a wide range of apps may lead to help address each

necessary area an individual with DD/ID may need. Douglass, Wojcik, & Thompson (2012), also

indicated that apps can provide a large amount of valuable support to individuals with DD/ID,

but also offered a caveat that some apps are still a work in progress, and do not always meet the

specific need of the individual. The continued use and evaluation will likely lead to the fixing these shortcomings, and providing greater functionality (Douglass, Wojcik, & Thompson, 2012).

Application of Technology to Autism

According to the Autism Spectrum Disorder Foundation (ASDF), iPads have been identified as a great device to facilitate communication and education among individuals with autism spectrum disorder (ASD). The ASDF notes the iPad's versatility as a main reason why it is so effective. The iPad is able to accompany the individual wherever they go, allowing it to be used in a variety of settings, and implemented situationally as needed. One of the biggest components of an iPad that is conducive to individuals with autism is the functionality of the touch screen. Users do not have to possess fine motor skills nor do they need to be have much coordination to effectively use the device. Users do not have to continuously move their eyes back and forth from the keyboard to screen as they would with computers. iPads are easily customizable, which is something that allows for a variety of skill and functioning levels to use the device. The ASDF also cites the iPad's ability to be able to be used for both leisure and education diminishes users to negatively associate it to learning or difficulty, which is helpful in getting users to engage. Overall, the iPad has been identified as technology that can benefit individuals with autism in numerous areas of functioning (Autism Spectrum Foundation, 2012).

A systematic review was completed by Knight, Mckissick & Saunders (2013) evaluating existing research about use of technology-based interventions in schools to teach individuals with Autism Spectrum Disorder academic skills. Results of the review yielded that it was apparent that iPads, iPods, and smartphones are being increasingly implemented in academic settings, but currently there is not enough evidence based research to conclusively show that these devices are more effective than other methods for academic instruction. The review also

yielded that those who implement the technology should be well aware of the risks and benefits that accompanies each implementation. Knight, Mckissick & Saunders (2013) also establish the importance of knowing the opportunity cost involved with potential implementation, as it is imperative to not waste time that is already limited, on efforts that may not be suitable for a given individual, and thus are futile. iPads have become more used among other professionals and parents, also. Both parents and professionals have positive attitudes towards having the individuals they support use iPads. More specifically, iPads and tablets are great for improving an individual's physical, cognitive, and communication skills. iPads have been shown to be a positive tool for helping students with autism learn more effectively. One study evaluated a year's worth of data taken from middle school and high school students who were given iPads to use for reading activities. The study showed that each student had improved their reading comprehension once they began using an iPad instead of traditional textbooks. Some students increased their comprehension by a margin of 50% (Price, 2011). Price (2011) also collected information from staff and parents about the use of iPads as a communication device by those they support, which yielded that the iPad was a preferred method of intervention as it provides more durability, cheaper cost and better appearance than other methods.

Professional Role in Response to Work with Individuals DD/ID

According to the 2010 Census, 3 percent of the population in the United States has a DD/ID (Bethesda, 2014). One of the core values of social work is to promote dignity and worth of a person, regardless of things such as an individual's abilities, history, or current situation (NASW, 2014). These values are core concepts to serving the most marginalized of individuals, which individuals with DD/ID often have been over the course of history. The acknowledgement of the person-in-environment approach is one that must be utilized especially in working with

individuals with DD/ID, their families and caregivers, service providers, and the programs that provide their support (Depoy, 2002).

As previously mentioned, individuals with DD/ID are participating in communities and greater society on more than ever before. With our society becoming more and more accepting of individuals with DD/ID, individuals have been integrated into communities on an increasingly larger scale. Integration within society has given the social work professions greater access to working with individuals with DD/ID and increasing their quality of life. Social workers are now supporting individuals with DD/ID throughout numerous domains, including but not limited to home and community-based supports, employment, housing, advocacy, and meaningful activities. Social workers provide a wide variety of support for individuals with DD/ID in numerous capacities. For example, social workers may assess need and eligibility for home and community-based waivers, and ensuring that adequate and necessary services are provided the individual to live in their least restrictive, desired environment. In regard to employment, social workers have the ability to help support individuals with DD/ID in workplace settings, form developing potential suitable employment to providing direct supervision and training. Additionally, social workers also have the ability to act as a liaison between the employee and employer to ensure both parties' employment needs are being met. Social workers often act in the capacity of supporting an individual with DD/ID in identifying, securing, and maintaining adequate housing. Professional duties can range from coordinating directly working with the individual to find placement in an adult foster care home, to identifying, authorizing and coordinating necessary supportive services in an independent housing setting. Professional roles in regard to advocacy for individuals with DD/ID can vary, but professionals who support these individuals are communicating their needs and what is important and what is not related to their

consumption of services. Social workers who work directly with individuals with DD/ID have

abundant insight into how these individuals can be supported best, and can act as agents of

change by communicating this information to their communities and greater society. Overall, the

professional response to working with individuals with DD/ID is to ensure that those they

support are able to maintain their health and safety while living in the most desirable way

possible (O'Brien, 2006). Ultimately, social workers are in a position to have an influential role

on the lives of individuals with DD/ID throughout the course of their lives. Many of the policies,

programs, and services utilized by individuals with DD/ID are informed by social work practice,

which means social workers have the capacity to have a profound impact on this demographic

from *micro*, *mezzo*, and *macro* level perspectives (Depoy, 2002).

Self-Determination and Quality of Life

As identified in the National Association of Social Worker's (NASW) Code of ethics

(2014), self-determination is identified as one of a social worker's ethical responsibilities to

clients. The NASW states that social workers should respect and promote the right of clients

served to self-determination, as well as assist them to establish and achieve desired goals

(NASW, 2014). The ethical responsibility of social workers to facilitate self-determination can

be easily applied to work with individuals with DD/ID. Research shows that individuals with

DD/ID exercise less self-determination than individuals without DD/ID (Stancliffe et al., 2000).

Research suggests that there is positive correlation between an individual's IQ and level of self-

determination (Nota et al., 2007); however, further research indicates that there are complexities

involved with level of self-determination that involve more than just cognitive capacity. Other

factors that impact levels of self-determination include age, living setting, and whether or not the

individual was employed (Shogren et al., 2007). Reduced self-determination among individuals with DD/ID might not be related to an individual's cognitive capacity, but more in regards to the lack of opportunity and, or access to employ self-determination. Many individuals with DD/ID have guardians, conservator's, family, and, or staff, that often handle much of the decision making on their behalf. Some individuals with DD/ID have been had decision making structures in place for much of their lives, thus have had minimal freedom to exercise self-determination (Stancliffe, 2001; Stancliffe et al., 2000). Research also indicates that individuals with DD/ID are able to exercise more self-determination report a higher quality of life. Using a quality of life questionnaire and a self-determination scale, Wehmeyer and Schwartz (1998), conducted a study that gathered information from 50 individuals with DD/ID in residential group homes regarding self-determination and their quality of life. Individuals who were allowed more choice and opportunity to exercise self-determination, rated their quality of life much higher than those who had less choice and were not self-determined. Given that self-determination is a social worker's ethical responsibilities, it is important that opportunity for self-determination to be exercised is provided and suggested by social workers. Empowering individuals with DD/ID to use self-determination to experience new things, including the use of mobile technology, may be a key factor in producing positive outcomes and a better quality of life (Wehmeyer & Abery, 2013).

Gaps in the Literature

This researcher conducted a search within the databases and libraries of St Catherine University and the University of St. Thomas to identify potential information useful about DD/ID and mobile technology. This researcher used terms such as Technology, iPhone, iPad, Tablets and Smartphone, and combined each of these terms with Developmental Disabilities and Intellectual Disabilities, separately to generate related information. This resulted in ten different

search sets used to gather pertinent information. The results of these searches yielded mixed

results, varying from disabilities that were not DD/ID, technology that was not related to any of

the types of mobile technology, nor was information specifically looking at the impact of use.

Unfortunately, much of the information available was not specifically related to DD/ID and the

use of mobile technology.

Information obtained by this researcher was skewed greatly towards information related

to mobile technology use among adolescents with DD/ID. Much of the research was centered on

the use of mobile technology among adolescent students in educational settings. This researcher

was unable to obtain much information about the use of mobile technology among adults with

DD/ID, nor was this researcher able to obtain identify if there was any correlation between use

and impact of mobile technology among adults who were first time users of devices and or were

not introduced to mobile technology in structured educational setting. This researcher used the

This researcher was unable to obtain information regarding the long-term impact of

mobile technology among individuals with DD/ID. Research is needed to explore the preferences

of devices within mobile technology and how they can be used for individuals with DD/ID.

Stephenson and Limbrick (2013) suggest that more and more research on the use of portable

touch screen devices for individuals with DD/ID is being published, but there is not enough

information to draw significant, concrete data. Also, in regards to mobile technology use among

individuals with ASD, Knight, Mckissick & Saunders (2013) suggest that there is plenty of

research regarding use among individuals with ASD, but there is not enough concrete evidence

to suggest that the use of iPads should be perceived as evidence-based practice.

Literature Review Summary

Mobile technology appears to have a strong impact on individuals with DD/ID. The use of smartphones, iPads and tablets seems to be allowing individuals with DD/ID to experience more independence and self-determination, as wells allowing for an improved quality of life. According to Bryant (2011), technological advancement has had a large impact on the lives of those with DD/ID. Individuals with DD/ID who are greatly limited by their disabilities may have experience benefits in everyday life and reduction in negative impacts from their disabilities because of the support through use of technology. Lancioni et al. (2013), further this idea as they suggest that use of mobile technology can help support, physical, mental, and social needs and generally improve overall functioning of those with DD/ID. The use of iPads have been identified as one of the most popular and effective types of mobile technology by the ASDF (2012), as they note the iPad is particularly useful due to its versatility, easy touch screen, ability to be customized, and can accompany the user wherever they go. This sentiment was echoed by Douglass, Wojcik & Thompson (2012), who suggest that the diverse functionality and the low cost compared to other assistive technologies makes mobile technology a valuable resource to individuals with DD/ID that can help promote increased community integration, independence, and self-determination. It is apparent that the ability to match the individual to proper technology is paramount. Regardless of mobile technology's potential positive impact on the lives of individuals with DD/ID, Bryant, Seok, and Ok (2012), suggest that it is of the utmost importance to ensure that the individual's competencies, the demands of their environment, and their desired personal outcomes are identified and used to adequately match the individual to technology, in order for the most gainful experience to occur. Implementing mobile technology and acknowledging the person-in-environment approach is one that must be utilized especially in

working with individuals with DD/ID, their families and caregivers, service providers, and the

programs that provide their support (NASW, 2014). Looking toward the future, Kines (2013),

notes that staff who support individuals with DD/ID hope future mobile technology will have an

increasing impact on these individuals' lives, and that innovations will continue to allow them to

have bigger presence in the world. Overall, there are many factors that influence the impact of

mobile technology on the lives of individuals with DD/ID, but this technology, whether it is

specific, specialized, or general to their disability, can help them overcome their disability and be

more independent people (Carey, Friedman, & Bryan, 2005) (Bryant, Seok, & Ok, 2012).

Conceptual Framework

The ecological perspective is a useful conceptual framework for understanding how individuals with DD/ID have been impacted by the implementation of mobile technology. The ecological perspective is a suitable framework as it addresses all the parts of a given situation, assesses how each interacts with each other, and provides insight into their respective influences. The ecological perspective's approach is effective for evaluating multi-layered social issues (Bronfenbrenner & Ceci, 1994). The ecological perspective helps address the person in environment concept, which attempts to understand an individual and their behavior in relation to the environment in which they live (Kondrat, 2002). The idea of person in environment directly relates to the research topic identifying the impact of mobile technology is dependent on the type and severity of the disability and the contextual environment in which it is used.

The ecological perspective is a concept that tries to identify and develop a greater understanding of the relationship between a person and their contextual surroundings. The ecological perspective evaluates the dynamic interactions that occur between individual and environmental factors, and how these interactions shape the personal experience on small, medium, and large scales. The ecological perspective was introduced as theory in the 1980's, primarily developed by Urie Bronfenbrenner, and most often applied to child development. The notion that a child is shaped by both personal and environmental factors is one of perspective's founding ideas (Bronfenbrenner & Ceci, 1994). Bronfenbrenner's interpretation of the ecological perspective is grounded in the theory that explains the interaction between an individual and their contextual environment, including the relationship between an individual and four main systems of their environment, the *microsystem*, *mezzosystem*, *exosystem*, and *macrosystem*.

The *microsystem* is defined as "a term used by social workers to identify professional activities that are designed to help solve the problems faced primarily by individuals, families and small groups. Usually micro practice focuses on direct intervention on a case-by-case basis or in a clinical setting" (Barker, 2005, p. 272). The smallest system in which an individual interacts is the *microsystem*. The *microsystem* is the environment where the individual lives, in which the individual influences the experiences that take place in this environment. The *microsystem* typically involves people or things that interact closely with an individual. Examples of *microsystem* could be an individual's family, friends, or healthcare providers (Forte, 2007). On a micro system level, investigating the impact of use of mobile technology among individuals with DD/ID can help identify how mobile technology can be used to better their lives. Examining the impact that mobile technology has on daily activities and how it shapes an individual's quality of life on the most basic level, may be extremely valuable. The direct impact mobile technology has on an individual and its interaction with its microsystem directly informs the other *mezzo* level, which can often lead to perpetuation, or change among the micro level situation. The development of specific technology, or the adaptation of current technology, to fit the precise needs of a person is learned at the *micro* level (Forte, 2007).

The *mezzosystem* is defined as "social work practice primarily with families and small groups. Important activities at this level include facilitating communication, mediation, and negotiation; education; and bringing people together" (Barker, 2003, pg. 272). The *mezzosystem* involves the mid-size system in which an individual participates. Examples of *mezzosystems* are the individual's community in which they reside, the school they attend, or the social groups in which they participate. On a *mezzosystem* level, assessing the impact of use of mobile technology among individuals with DD/ID can help inform how an individual's larger setting can support or

adapt a situation for a more positive outcome. Much importance is put on the *microsystem* level,

but any individual's biological configuration can be a determining factor in their success, as is

their family, community, and or school with which they interact. Identifying how the

mezzosystem impacts an individual is essential to understanding how participants in an

individual's *mezzosystem*, such as their school, doctors, or community groups can impact the

micro and macro level systems (Forte, 2007). An example of a *mezzosystem* impact is an

individual with DD/ID using an app on iPad for communication, which in turn allows her to

volunteer making lunches for senior citizens. The individual is now able to better communicate,

which allows them to get out into the community, participate in meaningful and gainful activities

that can provide for self-worth and reduce stigma about individuals with DD/ID.

The *exosystem* has been defined as "consisting of one or more settings that do not

involve the developing person as an active participant but in which events occur that affect, or

are affected by, what happens in that setting" (Bronfenbrenner, 1979, pg. 237).The *exosystem* is

the larger social setting in which an individual participates. It has an indirect impact on the

individual. For instance, the *exosytem* might be considered to be the culture of their respective

services providers that an individual utilizes. At the *exosystem* level, the culture and

characteristics of the individual's service providers have an impact on the individual. The

influence of the *exosystem* on an individual may be short term, but it can still have a lasting

impact (Forte, 2007). Information compiled by Algood, Hong, Gourdine & Williams (2011)

regarding how components of the *exosystem* including parenting stress, family's social support,

and the region where they live, can have a strong impact on the upbringing and overall quality of

life for an individual. An example of *exosystem* level impact is an individual's day program

being able to provide iPads that can be used by staff and individuals with DD/ID to connect to

the internet and access services and training to which they may not otherwise have access.

The *macrosystem* is defined as "social work practice aimed at bringing about

improvements and changes in the general society. Such activities include some types of political

action, community organization, public education campaigning and the administration of broad-

based social services agencies or public welfare departments" (Barker, 2003, p. 257).

The macro system involves the context of the larger setting in which an individual resides (Forte,

2007). Some examples of *macrosystems* might be individual's culture, society, or stigma

attached to living with a DD/ID. In the context of this research, an example of this for an

individual with DD/ID might be the home and community-based waiver system they use to

access supportive services in the community. On a *macrosystem* level, investigating the impact

of use of mobile technology among individuals with DD/ID can help identify how technology

can be used to better their lives. On a *macrosystem* level, the implementation of mobile

technology in the lives of individuals with DD/ID, may initiate societal changes that plug these

individuals into areas that provide mutually positive impacts. The identification of the impact of

mobile technology within the *macrosystem* can directly inform insurance companies, social

service providers, policy makers, and funding mechanisms about what activities, interests, and

needs of this population may be able to be addressed in the most effective methods. The

macrosystem in which an individual participates needs to be well-versed on impactful issues that

are important to their constituents (Forte, 2007).

The individual's experiences in relation to each of their systems, for instance, their group

home, healthcare providers, and, or insurance coverage, may impact their use of mobile

technology. Through use of the ecological perspective, the systematic impact of mobile

technology on the lives of individuals with DD/ID can be determined. The ecological perspective

provided a systematic view of these experiences. The fact that all of the systems in which an

individual participates affects each other, which in turn has some direct impact on an individual,

makes exploration of the influence of each system essential (Sontag, 1996). The researcher used

the ecological perspective framework to help guide the development of interview questions. The

researcher addressed the impact of mobile technology on the lives of individuals with DD/ID in

relation to each system in which they participate.

Methodology

Research Design

The purpose of this research project is to gain insight into the impact of mobile

technology use among individuals with DD/ID. This study used qualitative interviews to gather

information from study participants. Based on the findings and methodology used in the studies

contained in the literature review, a qualitative analysis appeared to be the most effective method

for gathering data. Qualitative research gathered information that provided insight into the

impact of mobile technology on the lives of individuals with DD/ID, and an in-depth

understanding of why and how their lives are being impacted (Denzin & Lincoln, 2005).

Information was gathered from the perspective of residential program managers who support

individuals with DD/ID through helping coordinate the cares and services at the residential

setting in which individuals live.

Sample

Residential program managers at a non-profit organization located in the western suburbs

of the Twin Cities metro area, which provides residential services to individuals with DD/ID,

were interviewed for this qualitative research project. Residential program managers are

individuals who manage the group homes and apartments in which the individuals with DD/ID

live. Residential program managers coordinate cares among clients, interdisciplinary teams, and

staff, as well as provide direct care to help individuals complete their activities of daily living.

The minimum education required to be a residential program manager was a Bachelor of Science

or Bachelor of Arts. The researcher sampled residential program managers who have at least

three years of experience providing direct care to individuals with DD/ID. The various needs of

the individuals with whom they work and help support, allow them to draw on vast experiences

that provides effective insight about the use and impact of mobile technology on the lives of individuals with DD/ID.

The convenience sampling technique was used to identify respondents for the research study. The convenience sample is the process by which the researcher selects respondents that are most accessible, and with whom it is easiest to gather data. Convenience sampling was identified as an effective method for gathering a large amount of information from a large sample size (Martin, 1996). The researcher was able to obtain enough sample size through use of the convenience sampling technique.

Protection of Human Subjects

St. Catherine's University Institutional Review Board reviewed and approved the research project. The Institutional Review Board approved the research project before any research was conducted. Before an interview was conducted, participants were provided the informed consent form (see Appendix B), which indicated the purpose of the study, why the participants were selected, the procedure of the study, risks or benefits associated with the study, issues of confidentiality, and that participation was completely voluntary. The participant reviewed and signed the consent form before they were allowed to participate in the project. Case numbers were assigned to identify each participant. Also, no identifying information was contained in the final report. Transcripts were maintained in a password-protected computer. The password was not known by anyone else besides the researcher. The researcher destroyed all data at the completion of the research project, which occurred by May 30th 2015.

Research Setting

The research for this project took place in a conference room at the central offices of the participants' employer. The conference room was closed to others and was a quiet and confidential space. The participants' employer is a non-profit organization that specializes in supporting individuals with DD/ID to help them realize potential achieve their dreams. The non-profit accomplishes this by providing a wide range of supportive services, but most prevalently residential group homes and apartment complex programs. The non-profit organization provides residential services supports over 200 individuals in more than forty group home and apartment complex residences across the western suburbs of the Twin Cities metro area.

Instrument

The researcher conducted qualitative interviews in order to obtain information from participants. The researcher developed a set of ten questions that addressed use of mobile technology among individuals with DD/ID. The researcher's committee reviewed and approved the interview questions before the interview questions were disseminated to ensure that any bias or leading questions were removed. The researcher distributed a flyer that provided information about the study, the interview questions, and the consent form to participants at the monthly meeting that all residential program managers attended. The flyer described the study, contained the researcher's contact information, and encouraged residential program managers who were interested in participating to contact the researcher. The researcher was contacted by eight residential program managers who agreed to participate. The researcher followed-up with potential participants in a period of a month by attending the next residential program manager meeting. Before the interviews, the researcher used a pre-interview questionnaire that collected demographic information and exhibited participants were residential program managers with at

least three years of experience providing direct care to individuals with DD/ID. The

questionnaire gathered information about the participant's gender, highest level of education

completed, percentage of the clients they support can make use of mobile technology, types of

mobile technology used, and years of experience working with adults who have DD/ID. The

researcher used a set of ten questions that cover various topics about mobile technology use

among individuals with DD/ID to guide the interview. Interview questions covered topics

various topics, including, but not limited to examining common uses of mobile technology,

positive and negative impacts of use, and future uses of mobile technology. The questions were

open-ended to allow the participants to express information exactly as desired.

Data Collection

The data collection process used the following steps:

1) Received written approval from the non-profit organization to offer study to residential

program managers; 2) the researcher attended residential program manager meeting to introduce

and distribute consent form and interview questions, and attended the next meeting in a period of

a month to follow-up; 3) potential interested participants were asked to contact the researcher to

arrange a meeting; 4) interviews were conducted, lasting approximately 30-60 minutes and

taking place in a conference room at non-profit organization; 5) the researcher distributed a $5

coffee card to participants after the interview; 6) the researcher transcribed the audio recordings.

Data Analysis

Data analysis used was based on the grounded theory methodology perspective, which is

a perspective that makes inferences from the data gained during the collection period, and not

from outside factors (Lavrakas, 2008). The information yielded from this study was taken from

the participants' answers to the interview questions. Ideas that repeatedly appeared throughout

the interview were identified, categorized, and coded by the researcher. The categories were

reviewed multiple times by the researcher. The ideas and subsequent categories were given codes

to reflect their central concepts. Ideas that are repeatedly featured were coded similarly and

grouped together to formulate themes.

Researcher Bias

Researcher bias was present throughout the course of the study, as the researcher has

personal experience working with individuals with DD/ID and mobile technology. The

researcher has served as a waiver case manager, program manager, and direct care staff working

one on one with individuals with DD/ID for approximately eight years. The researcher has

served this population in numerous capacities and has observed mobile technology use, which

has led to bias related to type of questions asked during the interview process. Bias was also

present when the researcher asked the participants questions, as the way in which the researcher

stated the questions may have produced leading or weighted questions. The researcher attempted

to reduce the presence of bias by having the interview questions screened by the research

committee to remove any parts that may have impacted the integrity of the project.

Findings

Sample

All of the interested participants met the minimum criteria for experience and education that the project specifically identified as a requirement. Interviews were completed over a four week period, beginning in the middle of February and concluding by the end of the second week in March. The sample consisted of five men and three women. Half of the participants had at least ten years of experience. The average years of experience was eight years, and the range spanning from three years to fourteen years. One of the participants attained education higher than a Bachelor's degree. Six of the eight participants reported supporting individuals at their respective programs who were 100% capable of learning how to use a mobile technology. Participants noted that each of their programs supports individuals who use most all of the devices considered to be mobile technology in this research study, including iPads/tablets, iPod Touch, and smartphones. Only two participants noted the use of an iPod Touch, and only one participant had supported a client who used an E-reader. For this section, participants will be referred to as participants 1-8. Numbers were assigned to participants based on the order of their participation in this research. The table below reveals the participant demographics.

Table 1.

Participant Demographics

Experience as Program Manager	Education	Gender	% of clients who can use mobile Technology	Types of Technology Used
11 years	Bachelor's	Male	76-100%	iPads/tablets, iPod Touch and smartphones
8 years	Bachelor's	Male	76-100%	iPads/tablets, and smartphones
11 years	Juris Doctor	Female	76-100%	iPads/tablets,

				and smartphones
14years	Bachelor's	Male	76-100%	iPads/tablets, and smartphones
11 years	Bachelor's	Male	51-75%	iPads/tablets, and smartphones
5 years	Bachelor's	Female	76-100%	iPads/tablets, E-readers and smartphones
6 years	Bachelor's	Male	51-75%	iPads/tablets, E-readers, iPod Touch and smartphones
3 years	Bachelor's	Female	76-100%	iPads/tablets, iPod Touch and smartphones

Themes

This section will provide themes among the information that was gathered from

participants. These themes recurred throughout the data collected via participant interviews. In

order to be considered a theme, at least three of the participants had to have discussed the idea in

their responses. This section also includes brief summaries of the responses participants

provided, as well as direct quotes that were pertinent to each theme. The strength of the theme

will be identified by showing the number of participants who communicated the theme in their

responses. Italics are used to identify quotes.

Increasing Mobile Technology into Everyday Life

When participants were asked to describe the role of mobile technology in the lives of

individuals with DD/ID, each of the participants noted that they would like to try to increase the

amount of use of mobile technology among the individuals with DD/ID whom they support. The

participants who noted this idea, generally stated that the implementation of mobile technology

devices with which an individual had familiarity, could be implemented in different methods to

provide benefit or an enhanced experience in other domains of the individual's life. These

participants stated that it is important to connect individuals to mobile technology to see how it

could be used to benefit the individual. One participant explained in the following quote:

"We need to get more devices and this type of technology to the individuals we support.
They can use them for so many things it is unbelievable. If we can get each individual access to
these devices on a semi-regular basis, I think we can really find out how great the impact might
be. You never know until you try to implement it in an individual's life as each device and person
is a unique situation (Case 6, page 1, lines 15-19)."

Another statement made during an interview provides similar sentiment, with one

participant stating:

"We got an individual an iPhone so he could use it to download an app that would help
him communicate with others. This individual has aphasia and has trouble getting others to
understand his speech. He has an app that he can put pictures or words into sequences and then
the app speaks the word or sentence. It worked well for that function, but he was also was able to
download a GPS app that helps show staff where he was when he entered the community
independently. This multi-functionality has allowed him to enter the community on his own as
well as better communicate his needs. There are so many things you can do with an iPhone that
makes life easier. We have to get these devices in the hands of our individuals to truly unlock the
technology's potential (Case 5, page 1, lines 20-28)."

Increasing use into daily lives was also a theme generated when participants were asked

to provide advice for other professionals who support individuals with DD/ID that use mobile

technology. Many participants stated (6 of 8) that it was important for professionals to be open to

implementing it the lives of those they support. These participants also stated that they did not

realize how well mobile technology worked even for those individuals with DD/ID who

appeared to be poor candidates for use. One participant stated the following:

"There literally is an app for everything. There is an app that can benefit everyone and
we just need to change our framework as to how we view people with disabilities as the capacity
for learning can be enhanced by the use of mobile technology. I think that we just can't assume
that it won't work for some people (Case 6, page 3, lines 125-128)."

Another participant provided a similar example:

"*I would advise others to embrace technology and try to begin using it. Even if it doesn't seem to be a fit for a given person, get the technology and learn about it. There are so many things that an iPad or smartphone can do, that there will probably be a use for it at some point* (Case 8, page 4, lines 155-158)."

All participants stated that with careful consideration and planning, mobile technology can likely have a purpose for all individuals, and it might be beneficial to implement and observe even if it this does not appear likely.

Increasing Independence

When participants were asked to describe the role mobile technology plays in the lives of individuals with DD/ID, all participant responses (8 of 8) included the idea that mobile technology use helps increase independence. Typically, responses described individuals with DD/ID using a smartphone to connect and communicate remotely with staff and other caregivers, to ensure that their health and safety needs were being met, without either side having to physically interface with one another. Participants' responses largely surrounded around individuals with DD/ID being able to access the community independently as they desired, when otherwise they would need to be accompanied by staff or caregivers if they did not have the communication technology that smartphones provide. One example provided by a participant was the following:

Individuals can use FaceTime or video calls to show us that they are standing in front of the mall, doctor's office, or wherever they are supposed to be. Without the ability to have simultaneous video evidence that an individual is where they say they are, it would be difficult for individuals to do this independently without health and safety being in jeopardy because of the vulnerabilities some individuals have. It would not be permissible without this technology (Case 2, page 2, lines 76-80)."

Another example of increased independence gained among individuals with DD/ID through use of mobile technology was exemplified by participants' responses that featured the use of specific teaching apps on iPads, tablets and smartphones. Many participants (6 of 8)

described greater independence being established through uses of teaching apps. Responses

included apps such as "ChoiceWorks," which provides prompts to help navigate daily routines,

"i Get…Cooking," which demonstrates cooking activities, and "StepByStep," which helps

provide support with problem solving and sequencing of daily activities. An example of this was

provided in the following quote:

"One of our clients uses her iPad to help teach her how to prepare meals on her own. The iPad sits on the counter next to the sink where she watches an interactive video showing how to prepare a given meal. We tried to do this with paper instructions but the client needed both verbal and visual prompts to really understand how to complete the steps correctly. We tried it on a lap top but it was difficult for her to use the mouse and keyboard, which caused great frustration. The touch screen works so well for the client. The laptop was also too big to fit on her counter. The iPad has been great for helping her learn how to make meals on her own, which is something she takes great pride in (Case 1, page 3, lines #90-93)."

Role among Professionals

When asked to describe the role of mobile technology among professionals who use it

when supporting individuals with DD/ID, many participants (6 of 8) described it as being helpful

for supporting their clients more efficiently. These participants stated that they spend less time

doing administrative tasks such as documenting information, filing paperwork, and calling staff,

which ultimately allows them to provide direct care to the individuals they support. One

participant stated the following:

"This kind of technology allows me post important notes on our program's communication book that we have on our online network. I don't have to drive to the office and use the computer in the office. I can send it using my iPhone when I'm out and about which saves a lot of time. The staff can access it using their phone if they are out and about, too. It makes things much easier and I don't have to text or call each one of them (Case 6, page 1, lines 26-30).

Another participant stated a similar idea, explaining that mobile technology allows for

more efficient processes. The participant stated the following:

"I can use an iPad to scan or take pictures of doctor's orders and send them to our nurse for her records. I don't have to drive the 30 minutes to our program site, then 30 more minutes the other direction to the main building to give the documentation to the nurse. I don't have to find a fax machine and wonder if it was sent correctly. I can quickly scan the documents and send it without having to waste all that time driving around and not being back at the program to help out the other staff and clients (Case 2, page 1, lines 28-32)."

Increasing Connectedness

When asked about the role mobile technology plays in the lives of individuals with DD/ID on a community or larger societal level, participants said that individuals with DD/ID are being able to greater connect with the communities in which they live and greater society in which they participate through use of mobile technology. A majority of participants (6 of 8) provided examples of individuals with DD/ID connecting through social media apps used on mobile technological devices. Participants noted that many individuals with DD/ID use their smartphones to access Facebook, Twitter, and Instagram. Participants cited that individuals can share photos, videos, and posts about their lives and what they deem as important, for everyone to see. Participants stated that mobile technology is helping individuals with DD/ID connect to their communities, which ultimately leads to a reduction of stigma and what it means to live with a DD/ID. One participant stated the following quote:

"I support a client who is very active on Facebook and Instagram. They post pictures and update their status often. They friend and follow many community organizations and events, and post pictures on their Facebook pages regularly. One client posted a great video of them having fun at an event, which got a bunch of views and 'likes.' It is a great help showing how amazingly great some lives are, which helps people understand more (Case 8, page 2, lines 58-62)."

Participants also stated that these forms of expression via social media have been key in getting more than just the individuals' friends, families, and caregiver's insight into their lives.

These support networks are able to convey these insights to others to raise general awareness

about DD/ID. Participants stated that it is now much easier for everyone to see and better

understand an individual's situation. One participant stated the following:

"Clients are always having their Facebook statuses liked, or pictures they post are being shared by others. This means that the content the client posts not only is visible to their friends, but to the friends of the friend that shared it. When this happens it allows for a greater number of people to see. If a client has 50 friends, and five of those friends, who have 500 friends each, share the content, that's a lot of people who will get a glimpse into their life. It helps spread awareness and what it means to have a disability (Case 4, page 4, lines 140-145)."

Increasing Advocacy

Another theme was generated by participants when asked about the role mobile

technology plays in the lives of individuals with DD/ID on a community or larger societal level.

Most participants (6 of 8) responded that in addition to using social media to connect with others

in their communities, individuals are beginning to access social media on their mobile

technology devices to advocate for better disability programs, policies, and services. Participants

described individuals using social media platforms to better connect with local and state

representatives that shape the programs and policies that drive the services in which they use.

Overall, participants expressed similar sentiments that mobile technology is making connecting

with the community in which individuals live and greater society much easier. One participant

describe the following situation:

"Individuals are able to access society more by using social media. Individuals can connect with community members or organizations across the state by use of social media. This is prevalent for those individuals who participate in disability advocacy. Many individuals organize together via social media to show support or promote events happening in the community that are important to them. An example of this was when the 5% campaign was happening last year. Many individuals, as well as their families and friends postage messages on local legislative body's Facebook, twitter, and Instagram pages providing examples of the importance of getting the 5% increase to the home and community based supports waivers that fund many of programs and services that individual use to support their independence. Being

able to connect with important government officials about the importance of certain legislative policies is an example of how mobile technology use among DD/ID has impacted society (Case 3, page 4, lines 150-161)."

Self-determination

When asked to describe the overall impact of mobile technology on the lives of individuals with DD/ID, all participants (8 of 8) explained that it is allowing individuals with DD/ID to have more choice, and to exercise greater self-determination. All participants (8 of 8) expressed that individuals with DD/ID have greater say about how they live their lives as a result of mobile technology use. Instead of individuals requiring staff to observe them taking their medications, they can now choose to use the "FaceTime" app, which is a video-calling app, or go to the staff office for medications. Some individuals enjoy interfacing physically, while others prefer to do so remotely, which provides further personal choice about how they receive their care. One participant stated the following:

"*The use of smartphones and iPads has allowed individuals we support to choose how we support them. Instead of us telling them that we need to come check on them at a certain time, or they need to have a staff accompany them into the community, they can now decide how they want to check in with us, whether it is via text, FaceTime, or logging into a GPS application and checking in to locations while they are out in the community. They are allowed to choose how we can support them best* (Case 8, page 1, lines 33-39)."

Participants also discussed the ability for individuals with DD/ID to be able to choose how they use mobile technology or if they want to use it at all to improve their ability to make their own decisions. One participant described this by stating:

"*We introduced iPads at the apartment program where individuals I support live, and offered each individual the opportunity to have one through grant funding we received. The majority of the individuals were very excited to get the chance to use them, while a few decided they were better off without them. These individuals did not want to take the time to learn them and preferred to have face-to-face interaction with staff each day. These individuals said that without staff being around as much, their lives would be less exciting. It was cool to see the differences in desires and the ability for each to choose their own style of support* (Case 7, page 1, lines 22-29)."

Each participant described the use of mobile technology as enabling individuals with DD/ID to have greater self-determination, which is an aspect that each established as being a large factor that impacts their quality of life.

Common Areas of Use

When asked about how mobile technology impacts the domains of leisure, communication, employment, socialization, and/or education, at least one participant provided examples of each; however, leisure, communication and socialization were the most commonly identified domains that mobile technology provided the provided the greatest impact. The domain of leisure was the most identified by participants (7 of 8). One participant stated the following:

"Individuals can load games on their smartphones or iPads and access them whenever they want. They can bring them with to doctors' appointments, on bus rides to work, or when lying in bed. It allows individuals to be able to play a game, watch a movie, or read an interesting book at any time. It can make a stressful situation more manageable, a time where sitting still can be difficult, easy, and a way to relax and provide structure during downtimes (Case 3, page 2, lines 47-52)."

Participants expressed that mobile technology is being used most for leisure activities. Participants identified the ability for individuals to watch entertainment, play games, or browse the internet as most common leisure activities. Participants expressed mobile technology's ease of use and ability to access leisure activities at the individual's convenience as a reason why it works so well. One participant provided the following:

"Individuals can download so many games, apps, shows, and books that they rarely get bored. There are so many things they can do at a click of a button. They can engage in something until they get bored, then try something new, on and on and on. It can be really helpful for individuals to have they are anxious or behaviors are present. It is something that they love, which helps bring them up when they are feeling down (Case 4, page 2, lines 59-64)."

Individual Risks

In response to the interview question that asks about the risks that come with mobile

technology use among individuals with DD/ID, all of the responses (8 of 8) were focused around

the inherent risks that are present for any user of mobile technology, disability or not. The

potential for fraud, identity theft, or financial exploitation were all answers provided by

participants. Participants described the risk as being present do to the inability for users to know

who know who is on the receiving end of information. One participant stated the following:

> *"There is always a risk of having someone steal information and exploit individuals*
> *financially, however, I think the methods that can be implemented to protect individuals can be*
> *taught very easily. More often I see individuals becoming vulnerable to incurring high internet*
> *or data charges when using iPads or smartphones. Some individuals do not understand how*
> *their data usage impacts their bill and if they only have a set amount of data to use per month, it*
> *can be difficult for them to manage. It is hard to get them to understand that if you use this app it*
> *is going to be a part of your data. You can't listen to Pandora all day at work because it will use*
> *all of your data. Some individuals end up with $300 bills after using too much data* (Case 5, page*
> *2, lines 68-75)."*

Many of the participants (6 of 8) stated that a risk of using mobile technology among

individuals with DD/ID is the potential for the individual to become too dependent on their given

device. Participants stated that some individuals with DD/ID use their device to complete an

increasingly high number of activities. Participants stated that some individuals with DD/ID have

had problems completing tasks when a device's battery dies, it is misplaced, or broken. The

following example was provided by a participant:

> *"Becoming too dependent on the technology. Some individuals use their phones for so*
> *much, that they are helpless without it. We don't want to have our individuals completely unable*
> *to do things without technology. For instance, if a battery dies or a devices breaks, we still want*
> *individuals to know how to do complete a given task when they cannot use technology* (Case 1,*
> *page 3, lines 96-100)."*

All of the participants (8 of 8) stated that they felt as though even with the risks presented

through use of mobile technology, the benefits far outweigh any of the potential risks. One

participant stated, "*It's a difficult thing to manage as we want to diminish the possibility of individuals being vulnerable, yet find a way to maintain their safety in situations that rarely occur* (Case 7, page 2, lines 73-75)." Another participant had a similar sentiment, stating the following:

"*Mobile technology has been great for a lot of things but at the same time it can limit socialization and communication. Individual might be so enthralled with what they are doing on the iPad that they are not talking to a real person in the real world. They are withdrawing from the outside world* (Case 8, page 3, lines 92-95)."

Each participant stated that the level of risk depends on the individual's cognitive abilities and whether they are able to learn and comprehend both the positive and negative consequences of using mobile technology. All participants all agreed that the ability for individuals to learn from their past experiences through trial and error, has a strong impact on the risk the individual may present.

Greater Risks

Overall, when participants were questioned about the potential risks that come with mobile technology use among individuals with DD/ID at a community or societal level, all participants explained they felt there was much less risk at this level than at an individual level. Many of the participants (7 of 8) described the risk on the community or societal as being related to individuals being exploited or tricked into letting others use their devices. One participant stated the following:

"*When individuals enter the community we try to really tell them to not let any strangers borrow their phone or use it to make calls. We have had one individual who loves going to the mall. He has been able to go the mall by using an app on his iPhone that shows staff where he is at all times. He has had his phone stolen twice after letting strangers borrow his phone to make calls. We have tried to educate him to not carry his phone where people can see it and to not let other use it, but he continues to do so. It took this individual nearly a year to save money for the iPhone and without it, he cannot access the community without it. So, it is a huge risk for him* (Case 6, page 3, lines 95-102)."

Another participant discussed a similar situation when describing an individual they

support who uses an iPad to maintain confidential information:

"We have a fairly independent client who goes to his doctor's appointments
independently and he loads all of his progress notes and health information on to his iPad and
brings it to his appointments for the doctors to use instead of handwriting notes. He wanted to
show everyone how he could things on his own, so he threw the paper copies of the doctor's
orders away and only maintained the electronic copies. This worked out fine until he lost his
iPad on the bus coming home. We had a heck of a time trying to figure out what the doctor
ordered and recommended (Case 3, page 3, lines 110-117)."

Each participant stated that they felt as though individuals with DD/ID have similar risks

to those without disabilities; however, given the vulnerabilities of the population, much more

training and education is necessary. One participant noted:

"The risks are the same for everyone, but the difference is that many of the individuals we
support, can't understand cause and effect. This is a big issue. We tell some individuals over and
over and they still continue to do the same things, regardless of the outcome (Case 5, page 2,
lines 70-74)."

Generally, as stated in response to individual risk, each participant expressed that the

level of risk depends on the individual's cognitive abilities, and whether they are able to learn

and comprehend both the positive and negative consequences of using mobile technology. As

with individual risks, all participants agreed that the ability for individuals to learn from their

past experiences has a strong impact on the risk the individual may present.

Reducing Risk Factors

Another theme that was identified throughout participants' responses was reducing risk

factors. When participants were asked to describe the risks of using mobile technology among

individuals with DD/ID, all participants (8 of 8) expressed the importance of trying to reduce

risks that accompany use. All participants expressed the need for individuals with DD/ID to be

educated and trained on how to effectively use mobile technology. Participants stated that this is

essential for reducing risks and ensuring the mobile technology is being used in a safe and

effective manner. One participant stated the following:

> *"We need to really help the individuals get use to the technology, If they are using FaceTime to check in with staff instead of staff coming down to check on them in person, than they need to be aware that they may not be getting the same amount of exercise that they use to. They may end up gaining weight, or they may need to implement an exercise regimen to offset it* (Case 7, page 3, lines 108- 113)."

One participant described the training and education behind getting individuals with

DD/ID to get the most out of mobile technology by providing the following statement:

> *"It is of the utmost importance that individuals are shown how the device can be used to get the maximum output, from both the positive and negative sides. We always try to show individuals what could happen if it is used incorrectly just so they know and are aware of what might happen* (Case 8, page 3, lines 124-128)."

Limited Access

When asked about the factors that impact individuals with DD/ID and their access to

mobile technology on an individual level, all participants (8 of 8) described funding,

affordability, and lack of training as main variables that impact access. Each participant stated

that high cost of mobile technology is what impacts access the most. Participants stated that cost

often limits what type of mobile technology is used or if at all. Participants stated that insurances

typically do not cover mobile technology devices, even if it is used for a doctor's ordered

activity, or if it is related to health and safety. One participant stated, *"Affordability of the item is*

often the biggest limiting factor in getting individuals access to this technology (Case 4, page 2,

lines 63-64)." Another participant stated the following:

> *"Many of the individuals who have these devices usually have family or friends who help them purchase these devices. iPads, tablets, and smartphones can be too expensive many times. Individuals have a limited incomes. Even those who are working a lot having limits on the amount of assets they can maintain, which makes it difficult to save up a lot of money to purchase these devices. A lot of folks do have families that want to make sure that they have these things to make their lives easier, but most do not* (Case 2, page 2, lines 56-62)."

Another participant described what it is like for some individuals with DD/ID to try to

access mobile technology with the following statement:

"The fragility of a lot of these items makes it difficult too. An individual can save enough money for an entire year to purchase an iPhone, only to drop it in the sink, get it wet, and damage it beyond repair, a short time after buying it. It can be difficult for individuals to go through this lengthy money saving process only to use the device for a short period of time. It just doesn't make sense for a lot of individuals given the cost and fragility of some of these devices (Case 6, page 2, lines 67-73)."

When asked about the factors that impact individuals with DD/ID and their access to

mobile technology on a community or societal level, all participants stated that cost and ability

for the individual's insurance or waiver to cover the item, were important factors in determining

if an individual would have access. Participants stated that if individuals are able to get mobile

technology provided through insurance, or county funded waivers, they are more likely to be

able to obtain access. One participant stated, "*Individuals can't afford these devices, but if*

Medical Assistance or their waiver could provide at least partial funding, it might be possible

(Case 5, page 2, line 80-82)." Another participant indicated a similar idea with the following

statement:

"Without some sort of outside funding mechanism, whether it is through a donation of older model devices, or money to purchase technology, most individuals will not be able to access it as insurance and waivers do not cover them because they are seen as an expensive luxury that is not necessary (Case 6, page 3, lines 110-114)."

One participant discussed how some individuals can access mobile technology via

community or societal factors with the following quote:

"If we can get a doctor to order a device to serve as a form of therapy there is a chance Medical Assistance may cover some or all of it. If we can prove that it is health and safety related the devices might be covered by the waiver. It is important that we show the great impact a lot of these devices can have on the quality of life for these individuals in order to get them funded and into their hands (Case 3, page 2, lines 82-86)."

Overall, participants felt as though that high costs of the devices and limited ability to have funding to be provided through insurance, waivers, or donations as factors that impact access on a community or societal level.

Success

When participants were asked to provide examples of the results of implementing mobile technology all participants expressed some idea about individuals being healthy, happier and safer. These responses varied, but all encompassed those three characteristics. One participant discussed how it supports maintain safety with the following quote:

"*We have individuals who can access the community on their own now because of some of the applications that help us monitor his whereabouts remotely. If he gets lost in the community, we can find him and pick him up with minimal issues. His safety is being maintained much easier* (Case 7, page 4, lines 130-133)."

One participant discussed success related to promoting happiness by stating, "*Individuals are able to do so much more on their own. They are happier and more satisfied with life because it enables them to live their lives as they desire, how they desire* (Case 2, page 3, lines 115-116)." Another participant provided a similar idea in regards to mobile technology ensuring individuals with DD/ID are able to live as they desire, while still maintaining their health. This idea is exemplified by the following quote:

"*It used to be a problem to get a particular individual to take his medications at night because he hated how staff had to enter his apartment to check if he had done so. He hated losing his privacy before bed. Now he can FaceTime and show us that he is taking his meds. He seems to have a much better relationship with staff now* (Case 1, page 4, lines 140-144)."

Feedback from Individuals

When participants were asked to discuss how they identify if mobile technology has been implemented effectively, a majority of participants (6 of 8) stated they identify it by the feedback

received from the individual who is using mobile technology. Participants stated they can see

effective implementation through the increase in positive behaviors and reduction of negative

behaviors, but the best indicator of successful implementation is by finding out how the

individual feels about using mobile technology. One participant stated the following:

"The individuals we support are always saying how much they enjoy using these devices.
They talk about how they enjoy being able to FaceTime with their friends and families, enter the
community on their own, and converse with others about current events that they accessed using
their devices (Case 4, page 3, lines 111-114)."

Another participant described how feedback from the individual is not only important to

see if implementation is successful, but to see if mobile technology should be implemented at all.

The participant stated the following:

"We have on individual in particular who we have been encouraging to get an iPad to
help access the internet; however, the individual gets stressed out easy and does not adapt to
change well. So, the individual stated she didn't want an iPad, even though it would make her
life easier (Case 2, page 3, lines 100-103)."

Among the participants (6 of 8) who stated they observe effectiveness by seeing a

reduction in negative behaviors, one described the process by stating the following:

"We have a technology assessment which program managers fill out. The assessment
shows what an individual might need and then it is reviewed by the technology manager to
identify the technology available to meet the need. We look at the assessment and provide the
quarterly data based on that assessment to see the technology is working. We have been using
these assessments that we developed to prove that there is a need for technology. It is an
assessment that shows the individual can get a need met by implementing technology. We use it
to show waiver funding that it is something that is of medical necessity (Case 5, page 4, lines
144-150).

More Opportunities in the Future

Another theme identified throughout interviewing participants was the idea that mobile

technology will continue to positively impact the lives of individuals with DD/ID. Each

participant (8 of 8) stated that they felt mobile technology will continue to further what it is

doing now, by making life easier, more efficient, and continuing to allow for greater self-

determination. One participant stated, *"The connectedness makes it easier for the individual and*

provides more flexibility for the individual to be independent, self-determination, makes more

choices on their own (Case 4, page 3, lines 128-130)." Another participant stated the following:

> *"I can see the future providing a great deal more opportunities for independence for*
> *people. If there are capabilities to use mobile technology, individuals can be in charge. They can*
> *direct their cares better. They can be the ones to seek others out, family, friends, and staff, to get*
> *their needs met by using technology. Individuals will have greater functionality* (Case 2, page 4,
> lines 160-164).

Participants also stated that they felt as though advancements in mobile technology will

allow for individuals who have limitations that severely impact their ability to physically use

mobile technological devices, to someday use them as easily as those who do not have physical

limitations. One participant stated the following:

> *"There is a smartphone now that you can use completely throw eye and head movements.*
> *You don't even have to have the capability of touching it, so it is becoming more accessible for*
> *people who otherwise who do not have physical capabilities to use it, now they can. I can*
> *envision a world where these individuals are able to communicate and use these devices as easy*
> *as we do, without need any physical abilities to do so* (Case 1, page 4, lines 156-160)."

Another participant echoed this sentiment by describing how the see future innovations to

mobile technology impacting individuals with DD, by expressing the following quote:

> *"Individuals who are not able to even use an iPad or a smartphone because of physical*
> *limitations, will be able to use it just as those without profound disabilities do. I think there will*
> *be innovations that allow for devices to be used and easily controlled by voice. Or getting*
> *devices to become so familiar with its user that it will do things for the user without being*
> *prompted. Future technology will probably allow for many individuals I've supported to live*
> *without formal supports they require now* (Case 8, page 4, lines 168-173)."

Other participants expressed a similar experience who communicated the following

quote:

> *"I think that technology will continue to play a large role with getting individuals to be*
> *more independent. Ease with communication will be the biggest thing. The easier we are all able*

to communicate, the better. I think it will be important to implement the correct technology for people so that it meets their needs. I think the more advanced we get, the more knowledgeable we will need to be in order for our clients to utilize technology that works best for them, and can make their quality of life better (Case 7, page 4, lines 146-152)."

Discussion

Sample

In order to secure research participants, the researcher distributed a flyer that provided information about the study, the interview questions, and the consent form to participants at the monthly meeting that all residential program managers attended. The flyer described the study, contained the researcher's contact information and encouraged residential program managers who were interested in participating to contact the researcher. The meeting attended by the researcher featured all residential program managers, which meant that study participation was offered to forty individuals. The researcher was contacted by eight of the forty residential program managers who agreed to participate. The desired number of eight participants was achieved; however, there was only a response rate of twenty percent. The response rate may have been impacted by several factors, including overall business of residential program managers and the lack of time they have for extracurricular activities, participation incentive not being great enough, and lack of mobile technology use among the clients with whom they work.

The convenience method used for sampling participants may have influenced the results of this study, as all of the respondents had the same job capacity, within the same organization. Although this study was confidential, many participants may have provided answers that depicted their experiences as positive, in order to reflect well on their employer. The differences in years of service may also have influenced the results of the study as some participants may have had more opportunity to become exposed to individuals with DD/ID using mobile technology. Participants who had little exposure to the experiences of individuals with DD/ID before the advent and subsequent implementation of mobile technology, may not have been able to adequately speak to the true impact. Half of the participants had at least ten years of

experience, which seems to indicate that much of the information gathered was from credible

sources. The experience, education and exposure to mobile technology of the residential program

managers who participated in this study, seem to be representative of most others at different

residential programs within the non-profit organization.

Themes

There were several overarching themes that appeared throughout each participant's

interview and the literature review. There were seven themes that were identified by participants

and the literature review. These themes included the following: increasing use, independence,

risk, matching, self-determination and quality of life, more opportunities in the future, and

limited access. Among these themes were those that aligned with the information in the literature

review and those that did not. The themes below will discussed in terms of how they were

represented by participants and the literature review, and if they supported or refuted each other.

Increasing Mobile Technology into Everyday Life

The participants who noted this idea generally stated that the implementation of mobile

technology with which an individual had familiarity, could be implemented in different methods

to provide benefit or an enhanced experience in other domains of the individual's life. These

participants stated that it is important to connect individuals to mobile technology to see how it

could be used to benefit the individual. Many participants (6 of 8) stated that it was important for

professionals to be open to implementing it the lives of those they support. These participants

also stated that they did not realize how well mobile technology worked even for those

individuals with DD/ID, who initially appeared to be poor candidates for use. Participants all

stated that with careful consideration and planning, mobile technology can likely have a purpose

for all individuals, and it might be beneficial to implement and observe even if it this does not

appear likely. These ideas aligned with research including information provided by Knight, Mckissick & Saunders (2013), who completed a systematic review yielded that it was apparent that iPads have become used more often among other professionals and parents, also. Both parents and professionals have positive attitudes towards having the individuals they support use iPads, but suggested that those who implement the technology, be well aware of the risks and benefits that accompanies each implementation. Price (2011) collected information from staff and parents about the use of iPads as a communication device by those they support, which yielded that the iPad was a preferred method of intervention because it provides more durability, a cheaper cost, and a better appearance than other methods. Although this information may not directly correlate, it proves that both participant information and existing research promote increasing mobile technology use among individuals with DD/ID.

Independence

One of the strongest themes identified throughout each participant's interview was independence. When participants discussed the role of mobile technology in the lives of individuals with DD/ID, all participants identified mobile technology as a means to help establish independence. This theme aligns with the findings of Douglass, Wojcik & Thompson (2012), who suggest that the diverse functionality and the low cost compared to other assistive technologies makes mobile technology a valuable resource to individuals with DD/ID that can help promote increased community integration, independence, and self-determination. Participants' responses largely surrounded around individuals with DD/ID being able to access the community independently as they desired, when otherwise they would need to be accompanied by staff or caregivers if they did not have the communication technology that smartphones provide. Participants also mentioned individuals using mobile technology to

connect with caregivers to communicate health and safety needs. All participants (8 of 8) also described apps being used to teach independent living skills to individuals with DD/ID.

Risks

Although most participant responses included that the benefits of using mobile technology outweigh the risk of using, there was a large response about the risk that is present to individuals with DD/ID with its use. Participants were asked to describe any risks that come with individuals with DD/ID using mobile technology on an individual, community and, or societal level. All participants (8 of 8) communicated that there is always some risk involved with use, but it is the same risk that anyone, with or without a DD/ID may face when using mobile technology. All participants (8 of 8) also noted that the biggest individual risk as being individuals with DD/ID becoming too dependent on mobile technology. Participants stated that the individuals with DD/ID have trouble coping when their given device breaks, runs out of battery, or becomes obsolete, which can cause problems with functioning or completing necessary tasks as they do not know how to do so without the help of their device. This information aligns with information compiled by Wise (2012) who emphasized the fact that our computer-dominated society and its text-based reliance on e-mail and cell phone texting will have unintended impacts that may end up marginalizing the populations who do not have the ability to use it.

Matching

Another theme that was identified throughout information gathered by this research project that appeared to align with existing research was the need to match the right kind of technology to the individual. All participants (8 of 8) expressed the importance of matching the correct mobile technology to the individual's needs and abilities. Each participant stated that it

was important to make sure that the smartphone, iPad, or tablet being implemented, and subsequent programs, apps, or functions of the technology, are appropriate for the individual. Existing research echoed this theme, which was especially exemplified by the systematic review conducted by Knight, Mckissick & Saunders (2013) that evaluated the use of technology-based interventions in an academic setting to teach individuals with Autism Spectrum Disorder. The systematic review noted that the decision to use technology must be made on a case by case basis so the individual's needs are being met appropriately. The review also noted that the use of technology should be implemented with proper instruction of its use, as well as constantly evaluating use to ensure that the technology is a good match for the individual, and if it is not, changed when necessary (Knight, Mckissick & Saunders, 2013).

Self-determination and Quality of Life

When asked to describe the overall impact of mobile technology, all participants (8 of 8) explained that it is allowing individuals with DD/ID to have more choice, become more self-determined, and have a higher quality of life. All participants expressed that individuals with DD/ID have greater say about how they live their lives as a result of mobile technology use. Participants described individuals with DD/ID being able to choose how they access the community, receive support from staff, and spend their free time. Mobile technology allows for individuals with DD/ID to have more input into what care they receive, and how they receive it. This information aligns with information provided by Stancliffe (2001) and Stancliffe et al., (2000) which expresses that individuals with DD/ ID is a population that usually has minimal freedom to exercise self-determination. Wehmeyer and Schwartz (1998) discovered that individuals who were allowed more choice and opportunity to exercise self-determination, rated their quality of life much higher than those who had less choice, and opportunity for self-

determination. This information also aligns with existing research, including Wehmeyer & Abery (2013), who noted that empowering individuals with DD/ID to be more self-determined and try new things, may be a contributing factor in increasing quality of life. Other responses among participants included being able to use mobile technology for activities that brought the individuals joy and happiness.

More Opportunities in the Future

The idea that future advancements in mobile technology will continue to positively impact the lives of individuals with DD/ID was well expressed across participant responses (8 of 8). Participants stated that they felt as though it would continue to further what it is doing now, making life easier, more efficient, and allowing for greater self-determination. In addition to this idea, participants also expressed ideas that further innovation to mobile technology may even allow for individuals with profound and severe disabilities, to use it with high effectivity. Research aligns with information provided by Bryant (2011), who conveyed that technological advancement has had a large impact on the lives of those with DD/ID and individuals with DD/ID who are greatly limited by their disabilities, may have experience a reduction in negative impacts from their disabilities, because of the support from use of technology. Research provided by Knight, Mckissick & Saunders (2013), indicates that technological advancement related to iPads, has led to increased versatility which has allowed for greater use and further implementation of these devices in schools over recent years.

Limited Access

A resounding theme expressed by all participants (8 of 8) was that limited access was a large factor on the impact of mobile technology on the lives of individuals with DD/ID.

Participants stated that funding, affordability, and lack of training were main variables that impacted access. Of these three factors identified, the literature contained affordability and training as components of getting mobile technology to be used by more individuals. Research by Bryant, Seok, & Ok (2012) aligns with participant information as they identified three common barriers to accessing mobile technology devices, which included a lack of funding for devices, insufficient training for service providers, and inadequate matching of technology to person. As mentioned before, Douglass, Wojcik & Thompson (2012), also suggest that the relatively low-comparable cost of mobile technology to other assistive technologies, makes these devices a very valuable resource; however, per participant responses, the cost of mobile technology, low fixed incomes, and limited ability to amass assets caused barriers for many individuals with DD/ID to access mobile technology.

Researcher Reaction

The researcher was not surprised by the results of this study. Most of the findings correlate with existing research, and many of the themes are not mutually exclusive. The largest theme seemed to be an overall idea that mobile technology use has a positive impact on the quality of life of individuals with DD/ID. This researcher also believes that mobile technology use can provide a positive impact on individuals with DD/ID, and can make supporting these individuals more person-centered and efficient. The researcher was intrigued by the versatility of many of the mobile technology devices, as well as the innovative methods in which individuals with DD/ID are using to make them best suited for their personal use. The researcher was impressed to hear the case studies and specific examples of how mobile technology can profoundly change the quality of life of an individual with DD/ID. The researcher found it rewarding to see that this population uses mobile technology in much of the same ways as those

without physical or cognitive limitations. The researcher found it comforting to hear that

individuals with DD/ID are getting to have more rewarding life experiences, in ways they prefer,

which seems to be an inherent human right that some individuals have not always been afforded.

The researcher was captivated by the thought of how future technological advances within

mobile technology may continue to make the lives of individuals with DD/ID more enriched.

Limitations/Recommendations for Future Research

There are limitations that restricted the potential effectiveness of this study. One

limitation was related to the small sample size. Future research may include a larger sample size,

in order to gather a greater amount of information that may better inform the researcher. It may

be helpful to interview participants who live outside a large metropolitan area, in order to gain a

better understanding of how individuals in rural communities may be using mobile technology

differently. Another limitation was the use of the convenience sampling method. The fact that all

of the respondents are employed at the same agency and in the same role, limited the insight into

the use and impact of mobile technology from any alternative professional perspectives. It may

be beneficial to interview other professionals who work with individuals with DD/ID, such as

healthcare providers, case managers, or employment coordinators, in order to identify its impact

in these respective domains. Another limitation identified was the experiences of the participants.

Due to each participant's experience serving individuals with a wide range of DD/ID, their

responses were not all focused on the same kinds of DD/ID. It is recommended that future

research is refined to focus on specific types of DD/ID, or functioning levels of individuals with

DD/ID to further examine the impact of mobile technology and how it is being used for specific

tasks. This research could potentially help inform how mobile technology can be tailored to meet

specific limitations or deficits that commonly appear in a given DD/ID. Overall, future

researchers are recommended to use online surveys, offer more incentive for participation, and open participation to other professionals, in order to obtain a more diverse and expansive sample size and enhanced the results.

Implications for Future Research

The implications of this research on social work practice identify a need for change with regard to how we view individuals with DD/ID. One of the resounding themes found in this research was how the use of mobile technology helps increase connectedness of individuals with DD/ID to the communities and societies in which they participate. All participants (8 of 8) explained that this increased connectedness ultimately leads to a reduction of stigma and what it means to live with a DD/ID. Participants also described how individuals with DD/ID are using social media on their mobile technology devices to advocate for better disability programs, policies, and services. Social workers can use this information as grounds to advocate for individuals to get access to mobile technology in order to spread awareness about the lives of individuals with DD/ID, which also could potentially reduce stigma related to DD/ID. Social workers can also develop ideas and strategies for individuals with DD/ID to use mobile technology to effectively inform the greater world about their lives, which may shift the way society views DD/ID, and subsequently force positive change and increase the amount of opportunities this population has within society. The ability for social workers to get individuals with DD/ID greater connectedness may also positively influence important decision makers that impact the culture and structures that govern how individuals with DD/ID are able to live their lives.

Another theme found in this research impacts social work practice is the theme of self-determination. All participants (8 of 8) described mobile technology use as a means for individuals with DD/ID to have greater choice in how they live their lives. Social workers who support individuals with DD/ID have special insight into the importance of self-determination among this population. This research can inform social workers how mobile technology can increase self-determination and, in turn, social workers can advocate for individuals with DD/ID to have access, funding, and training that would allow for effective use of mobile technology. Additionally, social workers can help develop plans and programs that set up opportunities for individuals with DD/ID to demonstrate their positive impact that self-determination provides, and the role mobile technology may play. As one of the core. Social workers can also be agents of change that promote self-determination among individuals with DD/ID who have never had the chance to use of mobile technology. Engaging individuals with DD/ID with mobile technology may lead to greater use of mobile technology which in turn could be a mutually beneficial to these individuals and greater society.

Conclusion

The purpose of this research project was to gain insight into the impact of mobile technology use among individuals with DD/ID. Mobile technology and use among individuals with DD/ID was identified as an important topic, as individuals with DD/ID, are engaging in their communities and society more now than ever before, with the support of this technological advancement. Individuals with DD/ID are using mobile technology to help increase participation in increased amount of community activities that not only benefit their lives but the greater systems in which they engage. The study's research revolved around the experiences of professionals who work closest with individuals with DD/ID, which provided valuable, first-

hand insight into the impact of mobile technology. This study also helps provide information on a topic that has relatively limited available research.

Information gathered through this study indicate that mobile technology appears to positively impact the quality of life of individuals with DD/ID by increasing independence, self-determination, and community connectedness. One of the strongest themes in this study was how the use of mobile technology among individuals with DD/ID helps increase their connectedness to the communities and societies in which they participate. Increased connectedness ultimately leads to a reduction of stigma and increases awareness about what it means to live with a DD/ID. Increased was also described as a method for individuals with DD/ID to advocate on their own behalf, and urge for better disability programs, policies, and services. Individuals with DD/ID can take advantage of the connectedness provided by mobile technology to effectively inform the greater world about their lives, which is an important part of shifting societal views about individuals with DD/ID, and subsequently forcing positive changes to societal structures that often dictate the amount of opportunities this population has within society. Another strong theme was increased connectedness. Increased independence was also described as a result of individuals with DD/ID using mobile technology. Results indicated that increased independence was achieved through learning new independent living skills, remote monitoring to ensure health and safety are met while alone, and communicating with staff or other caregivers while accessing the community independently, which would otherwise not be possible without the presence of mobile technology. Self-determination was also identified as strong theme throughout the research. Individuals with DD/ID are using mobile technology to replace supervision they usually receive from staff and caregivers. Individuals with DD/ID are now able to choose how and when they receive supports. Individuals with DD/ID are able to

have greater say about how they live their lives as a result of mobile technology use, which is a strong determinant of quality of life.

Overall, this study shows that mobile technology is having mostly a positive impact on the lives of individuals with DD/ID. Mobile technology can potentially change the very definition and societal meaning of a disability, and will continue to shape the lives of so many. The increased versatility and relative ease of use of mobile technology has allowed it to be very practical for use among individuals with DD/ID. The diverse functionally and relatively low-comparable cost to other assistive technology devices makes mobile technology a very valuable resource that can help promote independence, self-determination, community integration, and an overall better quality of life. As one participant stated:

> "*It is important for individuals with DD/ID to get to choose how they live their lives as much as possible. It is unbelievable how such a small device can really allow this to happen. I am continuously shocked to see how it is making lives better, easier and more fulfilled* (Case 6, page 1, lines 22-24)."

References

Accessible Technology Coalition (2014). iPad/iPhone/iTouch AAC apps. Retrieved from:

http://atcoalition.org/article/ipadiphoneitouch-aac-apps-sorted-age-appropriateness

Algood, C., Hong, J.S., Gourdine, R., Williams, A., (2011). Maltreatment of children with

developmental disabilities: An ecological systems analysis. *Children and Youth Services*

Review, Volume 33, Issue 7, Pages 1142-1148. doi: 10.1016/j.childyouth.2011.02.003

Autism Spectrum Disorder Foundation (2012). Why the iPad is such a helpful tool for children

with Autism. Retrieved from: http://www.myasdf.org/site/

Barker, R., L. (2003). The social work dictionary. Baltimore, MD: NASW Press., 5th ed.,

(ISBN:087101355)

Bethesda Institute (2014). Intellectual or Developmental Disabilities: How prevalent are

Intellectual and Developmental Disabilities in the United States? Retrieved from:

http://bethesdainstitute.org/document.doc?id=413

Boyle, C., Boulet, S., Schieve, L., Cohen, R., Blumberg, S.J., Yeargin-Allsopp, M, Visser, S, &

Kogan, M.D. (2011). Trends in the prevalence of developmental disabilities in US

children, 1997–2008. *Pediatrics*. 2011; 27: 1034-1042. doi: 10.1542/peds.2010-2989

Bradshaw, Jill. (2013). "The use of augmentative and alternative communication apps for the

iPad, iPod and iPhone: an overview of recent developments." Tizard Learning Disability

Review, Vol. 18 Iss: 1, pp.31 – 37

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and*

design. Cambridge, Mass: Harvard University Press

Bryant, B. (2011). Assistive technology and supports provision: a selective review of the

    literature and proposed areas of application. *Exceptionality.* 18(4), 203–13.

Bryant, B., Bryant, D., Seok, S., Ok, M. (2012). Individuals with intellectual and/or

    developmental disabilities use of Assistive Technology Devices in Support Provision.

    Journal of Special Education Technology. Vol. 27, Iss: 2.

Carey, A. C., Friedman, M. G., & Bryan, D. N. (2005). Use of electronic technologies by people

    with intellectual disabilities. *Mental Retardation, 43*(5), 322–333.

Center for Disease Control and Prevention (2014). Developmental disabilities. Facts. Retrieved

    from: http://www.cdc.gov/ncbddd/developmentaldisabilities/about.html\

Center for Parent Information and Resources (2014). The Assistive Technology Act. Retrieved

    from: http://www.parentcenterhub.org/repository/ata/#purpose

Denzin, N., & Lincoln, Y. (Eds.). (2005). *Handbook of qualitative research* (3rd ed.). Thousand

    Oaks, CA: Sage.

DePoy, E. (2002). Theoretical approaches to disability content in social work education. *Journal

    of Social Work Education*. Available at: http://www.highbeam.com/doc/1G1-

    82739471.html

Douglas, K., Wojcik, B., & Thompson, J. R. (2012). Is There an App for That? *Journal of

    Special Education Technology*, *27*(2), 59-70.

Forte, J. A. (2007). *Human behavior and the social environment: Models, metaphors, and maps

    for applying theoretical perspectives to practice.* Belmont: Thompson Brooks/Cole.

Kagohara, D. M., Van der Meer, L., Ramdoss, S., O'Reilly, M., Lancioni, G., Davis, T., & Sigafoos, J. (2013). Using iPods and iPads in teaching programs for individuals with developmental disabilities: A systematic review. *Research in Developmental Disabilities* 34 (2013) 147–156

Kines, Lindsay. (2013). iPads open up new world for people with disabilities. *Times Colonist.* Retrieved from: http://www.timescolonist.com/news/local/ipads-open-up-new-world-for-people-with-disabilities-1.83860

Knight, V., McKissick, B. R., & Saunders, A. (2013). A review of technology-based interventions to teach academic skills to students with autism spectrum disorder. Journal of Autism and Developmental Disorders, 43(11), 2628-2648. doi:10.1007/s10803-013-1814-y

Kondrat, M. E. (2002). Actor-centered social work: Re-visioning "person-in-environment" through a critical theory lens. Social Work, 47(4), 435-448. doi:10.1093/sw/47.4.435

Lancioni, G., Sigafoos, J., O'Reilly, M., & Singh, N. (2013). Technology interventions for individuals with severe/profound and multiple disabilities. *Autism and Child Psychopathology*. New York: Springer Science & Business Media. doi: 10.1007/978-1-4614-4229-5_1

Lavrakas, P. (2008). Encyclopedia of survey research methods: Intercoder reliability. Vol. 1. Thousand Oaks, CA: SAGE Publications.

Marshall, Martin. (1996). Sampling for qualitative research. *Family Practice.* 13 (6): 522-526. doi: 10.1093/fampra/13.6.522

National Association of Social Workers. (2014). *Code of Ethics of the National Association of Social Workers.* Retrieved from http://socialworkers.org/pubs/code/code.asp

Nota, L., Ferrari, L., Soresi, S. & Wehmeyer, M. (2007). Self-determination, social abilities and the quality of life of people with intellectual disability. *Journal of Intellectual Disability Research.* 51: 850–865. doi: 10.1111/j.1365-2788.2006.00939.x

O'Brien, John. (2006) Perspectives On "Most Integrated" Services for People with Developmental Disabilities. Responsive Systems Associates. Retrieved from: http://thechp.syr.edu/wp-content/uploads/2013/10/most_integrated.pdf

Pew Research Center. (2014). Cell phone activities. Pew Research Internet Project. Retrieved from: http://www.pewinternet.org/data-trend/mobile/cell-phone-activities/

Pew Research Center. (2014). Device ownership over time. Pew Research Internet Project. Retrieved from: http://www.pewinternet.org/data-trend/mobile/device-ownership/

Pollack, H. A. (2011). Health policy and the community safety net for individuals with intellectual disability. *Developmental Disabilities Research Reviews, 17,* 44-51. Doi: 10.1002/ddrr.138

Price, A. (2011). Making a difference with smart tablets: Are iPads really beneficial for students with Autism? Teacher Librarian, 39(1), 31–34

Scherer, M. J. (2002). Assistive technology: Matching device and consumer for successful rehabilitation. DC; US; Washington: American Psychological Association. doi:10.1037/10420-000

Shogren, K., Wehmeyer, M., Palmer, S., Soukup, J. H., Little, T. D., Garner, N., & Lawrence, M.

  (2007). Examining individual and ecological predictors of the self-determination of

  students with disabilities. *Exceptional Children*. 73, 488–509.

Sontag, Joanne Curry. (1996). Toward a comprehensive theoretical framework for disability

  research: Bronfenbrenner revisited. *Journal of Special Education*, v30 n3 p319-44 Fall

  1996. DOI: 10.1016/j.ridd.2012.07.027

Stancliffe, R. J. (2001). Living with support in the community: Predictors of choice and self-

  determination. Mental Retardation and Developmental Disabilities Research Reviews, 7,

  91–98.

Stancliffe, R., Abery, B. H., Springborg, H., & Elkin, S. (2000). Substitute decision making and

  personal control: Implications for self-determination. Mental Retardation.

Stephenson, J., & Limbrick, L. (2013). A review of the use of touch-screen mobile devices by

  people with developmental disabilities. *Journal of Autism and Developmental Disorders*.

  Advance online publication. doi:10.1007/s10803-013-1878-8

Talukdar, D., & Gauri, D. (2011). Home internet access and usage in the USA: Trends in the

  socio-economic digital divide. *Communications of the Association for Information

  Systems* 28. Retrieved from: http://aisel.aisnet.org/cais/vol28/iss1/7.

The Arc of Minnesota. (2014). About the Arc of Minnesota. Retrieved from:

  http://www.thearcofminnesota.org/index.asp?Type=B_BASIC&SEC={685ED6C6-

  125D-4C36-BF2D-6F7171E6C82D}.

The Assistive Technology Act of 1998, 29 U.S.C. 3001 et seq., §§ 3 (2004). Retrieved from:

    http://www.gpo.gov/fdsys/pkg/PLAW-108publ364/html/PLAW-108publ364.htm

Wehmeyer, M. & Abery, B. (2013). Self-determination and choice. *Intellectual and*

    Developmental Disabilities: October 2013, Vol. 51, No. 5, pp. 399-411.

Wehmeyer, M. L., & Schwartz, M. (1998). The relationship between self-determination, quality

    of life, and life satisfaction for adults with mental retardation. *Education and Training in*

    Mental Retardation and Developmental Disabilities. 33, 3–12.

Wise, P. (2012). Emerging technologies and their impact on disabilities. *The Future of Children.*

    22 (1).

Appendix A. Interview Guide

<u>Mobile Technology and Developmental/Intellectual Disabilities</u>
Please complete the demographic section by selecting the item that is best describes you. Please bring this form to the interview.

How many years you have been a Residential Program Manager?
3___   4___   5___   6___   7___   8___   9___   10+___   15+___   20+___

What is your highest level of education?
Bachelor's Degree___   Master's Degree___   Other___

What is your gender?
Male___   Female___   Other___

What percentage of the clients you support can make use of mobile technology?
0-25%____   26-50%____   51-75%____   76-100%____   Other____

What types of mobile technology devices do you see being used?
iPads/tablets____   iPod Touch____   E-readers____   Smart Phones____   Other____

Please review the questions below and identify key ideas for each question. Please bring this with you to the interview.

1. What role does mobile technology play in the lives of individuals with DD/ID?

    -Among professionals related to their work with individuals with DD/ID?

    -In larger society related to individuals with DD/ID?

2. Can you provide a case example describing how mobile technology impacts the quality of life of individuals with DD/ID?

3. Can you describe how mobile technology is impacting individuals in the domains of leisure, communication, employment, socialization, education?

4. How would you describe any risks that come with individuals with DD/ID using mobile technology?

   On an Individual basis?

   How about on at the community level? What about at a societal?

5. What are the individual factors that impact individuals with DD/ID accessing mobile technology? How about factors within their community or groups in which they participate? What about factor at a societal level?

6. How do you feel mobile technology use will impact the quality of life for individuals with DD/ID in the future?

7. What advice would you give other residential program managers when implementing mobile technology?

8. How do you assess if the implementation of mobile technology is impactful?

9. Can you provide a case example describing how you effectively implement mobile technology?

Thank you for taking the time to complete this interview!

Appendix B. Informed Consent

Mobile Technology and Developmental/Intellectual Disabilities
INFORMATION AND CONSENT FORM

Introduction:
You are invited to participate in a research study investigating the impact of mobile technology (iPads and tablets, iPod Touch, E-readers and Smart Phones) on the lives of individuals with developmental disabilities. This study is being conducted by Scott Muer, student at St Catherine University/University of St. Thomas School of Social Work, under the supervision of Dr. Michael Chovanec, a faculty member at the university. You were selected as a possible participant in this research because you are a Residential Program Manager and have at least 3 years, or 6,000 hours of experience working with individuals with developmental /intellectual disabilities DD/ID). Please read this form and ask questions before you decide whether to participate in the study.

Background Information:
The purpose of this study is to better understand the impact of digital technology on the lives of individuals with developmental disabilities. Eight to ten participants are expected to participate in this research.

Procedures:
If you decide to participate, you will be asked to answer the interviewer's list of questions, which is comprised of approximately 9 open-ended questions. The questions will be in regards to experiences working with individuals with DD/ID, their use of mobile technology and how it has impacted their lives. The research for this project will take place in a conference room at the respondent's employer, Hammer Residences' central offices, or a neutral site, i.e. public library room. This study will take approximately 30 to 60 minutes over one session and will be audio taped.

Risks and Benefits of being in the study:
There are no direct benefits to you for participating in this research. This research could further benefit individuals with DD/ID and their ability to access and use mobile technology to better their quality of life. There are minimal risks involved in this study. The risk is the inconvenience of taking time away from there away from their busy schedules to participate in the study. The researcher will address this inconvenience by arranging the interview when participants are available.

Compensation:
If you participate, you will receive a $5.00 gift card.

Confidentiality:
Any information obtained in connection with this research study that could identify you will be

kept confidential. In any written reports or publications, no one will be identified or identifiable. Individual quotes will be used in the final paper, but all identifiable information will be removed from the quotes. I will keep the research results in a password protected computer and the audio tape will be locked in a file cabinet at my residence. The audio will be erased once it is transcribed. The transcription will be destroyed once the information is coded. Only I and my research committee chair will have access to the records while I work on this project. I will finish analyzing the data by May 30th, 2015. I will then destroy all original reports and identifying information that can be linked back to you. The memory card containing the interview will be erased on or before May 30th, 2015.

Voluntary nature of Study:
Participation in this research study is voluntary. Your decision whether or not to participate will not affect your future relations with myself, Hammer Residences, Inc., or St. Thomas/St. Catherine University in any way. You may refuse to answer any of the survey items if you so choose. If you decide to participate, you are free to stop at any time without affecting these relationships, and no further data will be collected. The gift card will still be distributed if you choose to meet for any part of the interview.

Contacts and Questions:
If you have any questions, please feel free to contact me, Scott Muer, at (612) 251-5198. You may ask questions now, or if you have any additional questions later, the faculty advisor, Dr. Mike Chovanec: (651) 690-8722, will be happy to answer them. If you have other questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you may also contact Dr. John Schmitt, Chair of the St. Catherine University Institutional Review Board at (651) 690-7739. You may keep a copy of this form for your records.

Statement of Consent:
Your signature indicates that you have read this information and your questions have been answered. Even after signing this form, please know that you may withdraw from the study up to one week after signing, and no further data will be collected.

_____

I consent to participate in the study, and I agree for my interview to be audio-taped.

_____

Signature of Participant   **Date**

_____

Signature of Researcher   **Date**

Appendix C. Letter of Approval

From: Scott Muer
Sent: Wednesday, December 17, 2014 8:57 AM
To:
Subject: Qualitative Research Project

Re: Masters of Social Work Clinical Research Project

Dear   ,

I am writing to you to request approval for residential program managers to participate in a qualitative research project aimed to identify uses of mobile technology use among individuals with developmental/intellectual disabilities. I am hoping to interview eight to ten residential program managers, asking them questions about the use of use of mobile technology among the individuals they serve at the residential programs that they manage. The interviews will consist of 9 open-ended questions addressing a variety of areas of mobile technology use. The interviews should take around 30-60 minutes, depending on length of each program manager's responses. The majority of the interviews will be conducted in person at   , or a location mutually agreed upon between the researcher and participant. The interviews will be recorded and transcribed. The participants will be provided an informed consent, which is attached to this letter also, which fully explains their rights to the information in which they provide. Interviews will be recorded, and then transcribed. Information will be coded to identify themes across the information obtained from all residential program managers. Any information obtained in connection with this research study that could identify you will be kept confidential. In any written

reports or publications, no one will be identified or identifiable. Individual quotes will be used in the final paper, but all identifiable information will be removed from the quotes. I will keep the research results in a password protected computer and the audio tape will be locked in a file cabinet at my residence. The audio will be erased once it is transcribed. The transcription will be destroyed once the information is coded. Only I and my research committee chair will have access to the records while I work on this project. I will finish analyzing the data by May 30th, 2015. I will then destroy all original reports and identifying information that can be linked back to you. The memory card containing the interview will be erased on or before May 30th, 2015.

I sincerely hope that you will consider allowing me to be able to complete research at Hammer Residences, Inc.

Please feel free to contact me as specified below with any questions.

Sincerely,

Scott Muer
Master's of Social Work Student
St Catherine University/University of St. Thomas
612-251-5198

From:
Sent: Wednesday, December 17, 2014 9:09 AM
To: Scott Muer
Subject: RE: Qualitative Research Project

Hi Scott:

This sounds like an exciting project. You have my permission to contact managers and ask if they would participate. Good luck with the project. If you are able to share any of your findings at the end, I would be interested.

Thanks,

CEO

Appendix D. Research Flyer

Mobile Technology Use and Developmental/Intellectual Disabilities

You are invited to participate in a research study investigating the impact of mobile technology (iPads and tablets, iPod Touch, E-readers and Smart Phones) on the lives of individuals with developmental/intellectual disabilities. This study is being conducted by Scott Muer, student at St Catherine University under the supervision of Dr. Michael Chovanec, a faculty member at the university.

If you are a Residential Program Manager and have at least 3 years or 6,000 hours of experience working with individuals with developmental/intellectual disabilities and would like to participate, please contact the researcher Scott Muer by email at muer4255@stthomas.edu or by phone at 612-251-5198.

You will be offered a $5 coffee card for your participation. Please see the interview questions below and the attached informed consent for more details. Thank you!

1. What role does mobile technology play in the lives of individuals with DD/ID?
   -Among professionals related to their work with individuals with DD/ID?
   -In larger society related to individuals with DD/ID?
2. Can you provide a case example describing how mobile technology impacts the quality of life of individuals with DD/ID?
3. Can you describe how mobile technology is impacting individuals in the domains of leisure, communication, employment, socialization, education?
4. How would you describe any risks that come with individuals with DD/ID using mobile technology? On an Individual basis? How about on at the community level? What about at a societal?
5. What are the individual factors that impact individuals with DD/ID accessing mobile technology? How about factors within their community or groups in which they participate? What about factor at a societal level?
6. How do you feel mobile technology use will impact the quality of life for individuals with DD/ID in the future?
7. What advice would you give other residential program managers when implementing mobile technology?
8. How do you assess if the implementation of mobile technology is impactful?
9. Can you provide a case example describing how you effectively implement mobile technology?