A Thesis

entitled

Technology and the Grandparent-Grandchild Relationship: Learning and Interaction

by

Donna M. Hunt

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Masters of Liberal Studies Degree in Liberal Studies

_________________________________________
Dr. Jacqueline Layng, Committee Chair

_________________________________________
Dr. James Benjamin, Committee Member

_________________________________________
Dr. Lawrence Anderson, Committee Member

_________________________________________
Dr. Patricia R. Komuniecki, Dean
College of Graduate Studies

The University of Toledo

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An Abstract of

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This study uses a survey exploring the grandparent-grandchild relationship to investigate how grandparents learn to use technological devices and specifically whether grandchildren are a source or aid in this process. This study concurrently investigates the use of technology as an intergenerational communication tool. Convenience sampling of grandparents reveals that grandchildren play a moderate to significant role in grandparents’ learning of technological devices. Moreover, this study confirms grandparents’ high level of satisfaction in the learning process, along with interest and desire to interact with grandchildren at the technological level.
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Chapter 1

Introduction

Grandparenting is an important factor for some 70% of the senior population, and the grandparent-grandchild relationship is generally valued and viewed as positive by both generations (Quadrello, et. al, 2005, Friedman, Hechter, Kreager, 2008). Grandparents, however, often complain that they hardly get to see their grandchildren and when they do, they’re plugged into some technological gadget. At the same time, grandparents may often acquire many of these same devices but have little to no idea how to use them. Older adults’ interests in their new tech toys may quickly fade because they find the language of instruction manuals difficult-to-incomprehensible, while the multiple functions of once-simple devices appear complicated or confusing (Manning, 2011).

Pointing out that a new and different competence in decoding pictures and texts is required to navigate the digital environment, Aarsand (2007) states that ‘digital literacy’ is perceived as the “fourth cultural technique” politically, ranking it with math, reading, and writing, and thus raises questions regarding those lacking this competence (p. 236).

So as some older adults manage to learn just the basic operations and others totally abandon the device, their tech-savvy grandchildren sit in another room or another city clicking away; communication meanwhile deteriorates with grandparents viewing
technology as the culprit. But can these same devices be used to enhance the relationship, and can grandparents benefit from their grandchildren’s knowledge and seeming fixation with technology? Cody, Dunn, Hoppin and Wendt (1996) affirm that providing Internet training to older adults is critical not only because of the rapidly growing senior population, but also because of significant benefits including increased intergenerational communication. Hughes and Hans (2001) state that “[r]esearch is needed that focuses not on technology itself but rather on technology within the context of studying family issues” (p. 790). Hughes and Hans note the importance of “moving beyond reporting of family members who are using [ICT (Information Communications Technology)] and begin to explore questions such as … who are they communicating with and about, … what role does computer-mediated conversation play in the overall pattern of communication within families …” (Hughes and Hans, 2001 p. 790).

1.1 Goals of the Study

The goal of this study is to provide further insight into the grandparent-grandchild relationship relative to technology. This study investigates and compares contemporary research on grandparent-grandchild communication activities in relation to technology—means and methods of interaction, ownership or access to technological devices, levels of satisfaction, and attitudes toward technology from the grandparent perspective. Using a survey, this study further explores these aspects, how grandparents learn to use technological devices and grandchildren’s level of influence, if any, on this learning. Concurrently this study addresses this learning interaction as an intergenerational communication tool.
1.2 Initial Rationale

According to an AARP and Microsoft report entitled *Boomers and Technology: An Extended Conversation* (Rogers, 2009), Baby Boomers, one-third of the population numbering nearly 106 million, control “50 percent of the country’s discretionary spending” and are “expected to outspend younger adults by $1 trillion in 2010” (Rogers, 2009, p. 3). Boomers, however, “are often not considered when experts chart consumer appetites for leading-edge technology and the next big thing.” Moreover, Boomers “are active adopters of new technology—but with a unique style driven by two aspects of their character” (Rogers, 2009, p. 3). These aspects are noteworthy when considering intergenerational communication and issues surrounding the digital divide. Rogers delineates these aspects, stating Boomers first are “at the midpoint of life’s cycles” (2009, p. 3), often responsible for children and aging parents, thus while observing the technology needs and wants of children and parents, they experience both brash enthusiasm and deliberate caution. Second, that while Boomers experienced the beginning of technology, they “created their social lives before the advent of ubiquitous communication” (Rogers, 2009, p. 3). Boomers “fear that their children, perhaps unwittingly, allow technology to shape their lives rather than using technology to help create the lives they want. Boomers want technology to fit the lives they have made and the values they hold dear” (Rogers, 2009, pp. 3-4).

This study evolves from earlier informal discussions with a number of Boomer grandparents aged late 50’s to early 60’s regarding their relationships with their grandchildren, aged three to early teens. In the initial conversations, these grandparents expressed concerns with their grandchildren’s perceived obsession with technological
gadgets and the effects of technology on their relationships with their grandchildren. Some grandparents voiced concern that even at the tender age of three their grandchildren show an obsessive interest in video and hand-held gaming and technological devices, and disappointment that older grandchildren shun family activities, even those centered on the child such as birthday parties or like celebrations, to engage in gaming, texting, and other technological activities. Moreover, these grandparents revealed anxiety over the long-term effect of this isolation not only on their grandchildren’s social interaction—their manners, ability to interact with adults and peers, and broad social ability, but also on their general health, as, according to their grandparents, physical activity declines while they remain sedentary for hours occupied with technological devices. Finally, the grandparents expressed frustration over their inability to find ways to engage their grandchildren in conversation and familial interaction. Although these reactions appear rather negative, these grandparents nonetheless exhibited a sense of amazement at their grandchildren’s seemingly innate technological knowledge, ability and agility. The fact that a toddler demonstrates the necessary comprehension and dexterity to successfully operate a remote or use a hand-held game console such as a Nintendo DS, and is as comfortable with such devices as he/she is with a bottle or baby toy was both frightening and amusing, while at the same time a source of grandparental pride in the offspring’s agility and intelligence. The researcher expressed these same concerns and shared her experiences with her grandchild that involved technological devices. The researcher invited her grandchild to teach her how to set up and use social media sites and a digital camera. Both the researcher and the grandchild found the teaching and learning experiences to be fun, rewarding, and productive. The researcher not only learned new
skills, but also and perhaps more importantly, discovered a new and pleasant way to share
time and interaction with the grandchild. The grandchild in turn had opportunities to
demonstrate knowledge and abilities beyond those of the researcher, thus increasing
ability while building self-confidence and social skills. Interestingly, the grandchild
began to imitate and exercise his own classroom experiences, breaking the teaching into
segments, checking that the researcher’s notes were correct, and assuring that the
researcher understood the particular process being explained before proceeding to new
steps.

Subsequently, further discussions ensued with colleagues regarding these initial
conversations and experiences, the importance of the grandparent/grandchild relationship
relative to technological devices, and whether technology can be viewed to enhance
rather than erode the relationship. This research intends to verify the reactions of
grandparents in the initial conversations and with colleagues with the literature and other
grandparents.

In order to prove or disprove the opinions expressed in the initial conversations
and with colleagues with the views of other grandparents, and further with the literature,
the researcher conducted a survey to investigate grandparent-grandchild communication
activities—means and methods of interaction, ownership or access to technological
devices, levels of satisfaction and attitudes relative to technology from grandparents’
perspectives. The initial conversations and key points of interest found in the literature
serve as a basis for survey questions.

As mentioned above, this study initiated with conversations between the
researcher and other grandparents aged late 50’s to early 60’s. These grandparents are
acquaintances of the researcher, are all employed, and thus have been exposed to technology—primarily computers, and communication technology in the form of cell phones. Ling reminds us that in the case of the younger elderly, technology “was well established during their working life. There is a fluency with the technology and its functioning that seems to have facilitated its adoption” (2008, p. 339). Ling (2008) also points out that stereotyping may inhibit the elderly from adopting technology and questions whether non-use results from lack of exposure or self-exclusion, or both (p. 334). While the researcher is interested in gaining insight into experiences and opinions of grandparents of all ages, the researcher believes that outlooks and encounters of grandparents who fall into the older elderly category and thus may have left the work environment and, as a result, are presumed to have less exposure to technology, is of particular interest. For this reason, and as will be delineated in the methodology, the researcher chose to conduct surveys at daytime senior centers with the expectation of gleaning opinions and attitudes of a somewhat older grandparent population.

1.3 Preliminary Literature Review

A preliminary literature review assessed contemporary research relative to this topic of study, and determined the justification for further research.

1.3.1 Attitudes and Influence

Public opinion along with positive and negative experiences may influence any person’s attitudes and decisions, and older adults may be particularly vulnerable to such encounters (Charness & Boot, 2009, Ling 2008). Not only the media but current literature as well offers a wealth of conflicting commentary about technology and its effects on society (Lanigan, 2009; Lenhart & Madden 2005, Gorard & Selwyn, 2008,
Mitzner, et. al, 2010). As dependency on technology increases, so does the realization of the need to nurture familial ties including, and perhaps especially, those between grandparents and grandchildren. Surveying grandparents to evaluate their levels of interaction, communication misgivings, attitudes towards their grandchildren, and perceptions of their grandchildren’s views toward them, Waites (2007) identified specific intergenerational barriers including difficulty and comfort with grandchildren’s language, music, and culture, while lack of contact due to familial distance eroded relationship quality. However, when asked for suggestions on improving relationships with their grandchildren, survey participants not only exhibited difficulty acknowledging their own communication issues, but also struggled to identify strategies.

While evidence exists that older adults experience difficulty in identifying methods to improve intergenerational relationships, other research delves into methods to rectify these problems. Ward and Smith (1997) state that although Americans place great value on intergenerational community, “forces separating the generations have increased the rift between old and young,” (p. 38) and explore how advances in information technology can both obstruct intergenerational communities along with ways in which it can narrow the gap. Shellenbarger (2011) notes that while teens’ enthusiasm and technical agility can be a great motivator for the elderly in learning new technologies, “daunting cognitive and psychological gaps between generations” necessitate attitude adjustments by both generations in the process (p. D3). In that regard, aspects of normative aging cannot be ignored when discussing the positives and negatives of technology on intergenerational relationships, but also in that regard, as noted by Rogers (2009), older adults “are always trying to sort out whether they have legitimate concerns
about social changes, or are merely showing their age” (p. 14). Beckenhauer and Armstrong (2009), for example, found that although seniors view email and mobile phones as positive mediums, some older adults voiced concern over grandchildren acquiring continually advancing technological devices resulting in grandparents’ constant need to update equipment in order to interface. In view of these and other conflicting circumstances and opinions, older adults can understandably become wary of technology and its many devices. In many instances, it is only with guidance and support of their families that they make the decision to invest in the new technologies.

1.3.2 Interaction Methods and Roles of Technology

Using a survey method along with in-depth interviews, Selwyn (2004, Exploring the role) examines children’s roles in adults’ acquisition and use of technology. Other research focuses on grandparents’ lack of digital literacy as an abstract resource to gain playtime with their grandchildren (Aarsand, 2007). Mori and Harada (2010) examined the family as a learning environment in older adults’ adaptation to cell phone use. Interviewing parents and grandparents of extended families to explore how technologies are used in communication, Tee, Brush and Inkpen’s (2009) study, while identifying not only differences in individuals’ perceptions of others’ desired communication, but obligatory and privacy issues caused by technology as well, nonetheless revealed grandparents’ desire for increased communication. Quadrello et al. (2005) studied patterns and usage of new technologies in grandparent-grandchild communication and factors affecting this form of communication. Kenner, Ruby, Jessel, Gregory and Arju (2008) investigated reciprocal teaching and learning of computer activities between
grandparents and grandchildren in which grandchildren provided computer skills and 
grandparents provided literacy skills and structural support.

1.3.3 Older Adults’ Needs and Methods of Learning

Livingstone (2001) maintains that “[i]n key respects, children and young people 
lead the way in terms of new media” (p. 308). While digital technology plays a crucial 
role in children’s lives, this is not necessarily so for older adults. Interviewing seniors 
(aged 60+), Selwyn (2004, Information aged) found that ICT (Information 
Communication Technology) was used for specific purposes and that when support is 
available, it generally comes from immediate family members and close relations. One 
might speculate that older adults need more reasons to invest the time, effort and cost 
associated with acquiring and adapting to technology and its varied devices. Quadrello et 
al. (2005) state that while grandparents enjoy connecting with grandchildren and employ 
various methods to do so, their use of new technologies pales in comparison to 
availability. They hypothesize that “educational experiences as well as strong incentives 
are still important factors, for older people especially” (p. 206). Ward and Smith (1997) 
discuss how older adults’ psychological and social needs can be facilitated by 
technology. Olson, O’Brien, Rogers and Charness (2011) research older adults’ patterns 
of usage as a basis for differences in technological knowledge. Lee-Shoy and Dreher 
Discussing family support and self-efficacy in older adults’ e-learning, Chu (2010), 
emphasizes that “encouragement or coercion from children who want their parents to 
make use of the computer and who provide support are the main motivations for older 
adults to learn to use the Internet” (p. 256). Cody et al. (1996) delineate Internet training
tools relative to older adult learners. Wagner, Hassanein and Head (2010) note the implications of older adults’ concerns and needs when assessing the use of technology; that adult computer usage is a “multi-disciplinary topic by nature” (p. 879), and stress the importance of further research in the field. They note that while significant research in this field exists, a “plethora of opportunities for further study in this increasingly relevant field” remain (2010, p. 879).

1.4 Research Questions

Prior research explores various facets of the grandparent-grandchild relationship relative to technology: influences of positive and negative commentary, how older adults learn and why they might choose to embrace the mechanics of technological devices, the role of children in grandparents’ acquisition of technological devices. This study further explored the grandparent-grandchild relationship relative to technology to gain insight to the following questions:

R1 How does technology aid in strengthening or weakening the grandparent-grandchild relationship?

R2 Do grandchildren enhance or reduce grandparents’ knowledge and/or use of technology?

In the process of analysis, three hypotheses were examined. The first and second hypotheses focused on grandparents’ needs, their desire to identify methods to improve relationships with their grandchildren, and methods of technological knowledge acquisition. The third hypothesis focused on grandparents’ satisfaction levels relative to technology and grandchild interactions.
R1a Technology and technological devices can be used to enhance the grandparent-grandchild relationship.

R1b Grandchildren play a significant role in grandparents’ knowledge acquisition and use of technological devices.

R2a Grandparents experience high interest and satisfaction levels interacting with grandchildren in the use of technology.

1.5 **Outline of Chapters**

1.5.1 **Introduction**

As familial structures change, the grandparent role in the lives of young adults is becoming increasingly important. The introduction provides an overview of changes facing the senior population relative to technology and its effects on their lives, and an overview of grandparents’ needs and ability to communicate with their grandchildren and the effects of technology on their communication. The introduction includes not only the researcher’s initial rationale for investigating this subject, but also research findings that reveal the importance of acquiring technological know-how for the senior population and the importance of maintaining intergenerational communication in ever-expanding familial settings. The introduction introduces the notion that grandchildren can play a significant role in grandparent’s knowledge acquisition of technology and related devices, and that this interaction can serve as a meaningful form of communication and positive activity between grandparent and grandchild. The introduction sets the tone and defines the purpose and strategy for the research.

1.5.2 **Literature Review**
The literature review encompasses a number of studies relative to technology and the senior population, focusing primarily on the grandparent – grandchild relationship. In this regard, the review explores findings of how seniors acquire technological expertise, their attitudes toward technology, and their perceptions of how technology affects younger generations, specifically their grandchildren. Further, the review delves into methods, or the lack thereof, that the senior population, grandparents in particular, experience in attempting to bridge the communication gap that they perceive exists between them and their grandchildren. The literature review also explores the array of commentary on the role grandchildren play in grandparents’ use of technological devices and their knowledge relative to technology.

1.5.3 Methodology

Using a survey, the goal of this study is to compare attitudes and opinions of grandparents with findings in the current literature. The inquiry method for the thesis project proceeds as follows:

To ensure economic and cultural reporting, the researcher targeted six senior centers within the Greater Toledo area and surrounding suburbs. The researcher used the Area Office on Aging Northwestern Ohio, Inc. website to identify non-residential senior centers in an effort to obtain a cross section of the senior population. Prior approval was gained to visit the sites in accordance with the University of Toledo Department of Human Research Protections. Because surveys were anonymous, the researcher petitioned for Waivers of Consent for participants.
As stated above, the researcher sought participation of up to six senior centers with a maximum of 300 participants. The researcher numbered the surveys, however, participants were not identified. The researcher collected completed surveys at each visit.

1.5.4 Results

The researcher solely compiled survey results in spreadsheet format. Each question was represented by a line allowing for each potential answer or box. Columns were created for each respondent. Results of questions were summed by number and percent of respondents to each question. Based on 25 surveys collected, for example, question 2, Gender: responses of 6 males, 19 females, 100% overall response, 24 percent male, 76 percent female. For questions using the Likert scale, Question 6, for example, cell phone as a communication method, results tallied overall total scores, number of respondents reported, percent of number reported, and average skill level.

Results were shared only with principal researcher and in the context of the study paper. Only the names of the centers are revealed in the study; no reference is made to number of surveys collected at each respective center. The results section of the study paper provides survey results.

1.5.5 Discussion

The discussion section compares the survey results to statistics and contemporary research findings. Possibilities for further research are discussed.

1.5.6 Conclusion

The conclusion summarizes the findings and the value of the study.
Chapter 2

Literature Review

Discussing the breadth of literature devoted to the effects of technology on society, Lanigan (2009) states that research focuses “on adoption and usage patterns or isolated variables, often ignoring the complex human, contextual, cultural, and technological interaction. There is a tremendous need for studies that examine the effects of technology on family functioning, processes, communication, roles, and relationships” (p. 595). Bailey and Ngwenyama (2010) state, “While research has tended to focus on each side of the generation gap, there are few studies which explore issues related to intergenerational interactions and their association with technology usage” (p. 63). As previously stated, the goal of this study is to provide greater insight into the grandparent-grandchild relationship relative to technology—how technology may strengthen the relationship and whether grandchildren enhance grandparents’ knowledge and/or use of technology. While exploring the grandparent-grandchild relationship from a technological viewpoint, insights into contextual, social, and cultural aspects of intergenerational communication may be gained as well.

Research focusing on topics such as adults’ acquisition and usage, knowledge sources, learning methods, or attitudes toward technology, while addressing any one of
these topics specifically, concurrently tends to delve into associated topics and to deal
with the issue of the perceived communication gap between older adults and children,
thus grandparents and grandchildren, as well. The literature review will therefore discuss
the primary focus of the respective research while addressing related topics and resultant
issues of communication and the grandparent-grandchild relationship.

In conducting this study, the grandparents’ perceived generation gap is an
overarching concept, and while aspects of this concept may be dealt with and ideally
overcome, aspects of normative aging generally cannot. When discussing
intergenerational relationships and thus the grandparent-grandchild relationship, the
notion of a “generation gap” and the term “digital divide” abound. At the same time, a
good deal of the literature offers conflicting observations on the effects of technology on
society. A review of key studies is therefore organized to first address the overarching
generation gap, i.e., digital divide and the aspects of normative aging, and second to bring
to light conflicting views found in the literature. The literature review will then follow
the structure of the study survey and methodology.

2.1 Generation Gap/Digital Divide and Normative Aging

For a number of reasons including limited learning and equipment resources,
many older adults may believe themselves to be, or in fact are, technologically
incompetent thus creating a digital divide. At the same they may view technology in
general and in terms of their relationship—their grandchildren’s perceived obsession and
resultant control of the medium—as the culprit that separates them from their
grandchildren, thereby creating the much feared and maligned “generation gap.”
Aarsand (2007), however, brings a most interesting viewpoint to the positive vs. negative
aspects of technology on intergenerational relationships, and offers a different perspective on the factors of lack of skills and generational technological control.

Sensitive to the concept of a generation gap, Aarsand studied interaction between parents and grandparents and children to explore the notion of the digital divide as a resource—how “generational differences may be drawn upon as social resources in social interaction” (p. 237). How children use digital technology to position themselves as instructors to perhaps control activities while parents and grandparents position themselves as novices or learners exhibits how each exploits the divide for different purposes. Parents and grandparents use the digital divide, i.e., the generation gap in a positive fashion—to gain interaction with children and to acknowledge the children’s competence. Aarsand states:

Somewhat paradoxically, … the digital divide in fact becomes a resource for both children and adults to enter and sustain participation in activities. The digital divide is not seen as an essentialist gap, or a fixed divider between the generations, but it emerges as asymmetrical relations that get co-construed in social action (2007, p. 251).

Factors of normative aging must be considered when evaluating the aspects of the digital divide. Moreover, as intergenerational relationships alone can be fraught with misunderstanding and confusion, it is quite understandable that for many elderly individuals, mixed reactions and confusion thrive when issues novel as technology are concerned. The notion of a generation gap may be invoked when, in fact, processes of normative aging are truly at play. Beckenhauer & Armstrong’s (2009) qualitative study focuses on the use of computers to facilitate communication among the elderly while in the progression of normative aging. Using open-ended questions to elicit opinions and views expressed in participants own words, they interview adults age 60 and over to
determine how older adults’ communication patterns are affected by normative aging, and the effects of computer ownership on older adults’ communication patterns. Key questions involved changes in communication patterns, preferred communication methods, whether computers made a difference in their communication, the role of communication in quality of life, and satisfaction levels in areas of communication. Although participants’ overall attitudes toward communication technology were definitely positive, aspects of normative aging arose for some older adults who “identified advances in technology as a concern,” stating feelings of uneasiness and an inability to interface with grandchildren’s “next generation stuff.” However, even these grandparents indicated a willingness to update in order to stay abreast and not be “left in the dust” (Beckenhauer and Armstrong, 2009, p. 838).

It appears that as research on the generation gap relative to technology or the digital divide expands and contemporsizes while at the same time older adults become more familiar with technology and its varied devices, the notion of a generation gap or digital divide, at least between grandparents and grandchildren, may have diminished over the years. In their study of intergenerational activities in community telecenters, Bailey and Ngwenyama (2010) note that while “[i]t is generally argued that there are issues related to the generation gap in the use of information and communication technologies (ICTs)” (p. 62), research nonetheless has found that intergenerational interactions relative to technology can generate benefits “such as knowledge sharing and increased understanding” (p. 62).

2.2 Conflicting Research, Conflicting Views
As conflicting research influences media, the populace in turn forms attitudes and opinions and the elderly may be more susceptible to these views. At the same time, as familial interactions are seldom black and white affairs, personality traits will surely come into play when measuring the effects of technology on familial interactions; thus, inconsistencies are certain to flourish. Noting these inconsistencies is important when considering factors of a generation gap or digital divide, and necessary when assessing outcomes and determining future research. Presenting a sociotechnological model “that organizes existing research and suggests areas for future study and intervention”, (Lanigan, 2009, p. 587) delineates a number of studies discussing effects of communication technology on the family that reveal conflicting results in terms of positive and negative outcomes. Kraut et al, (2002) states that while some research indicates that Internet and computer use can cause isolation and reduced communication (noted in Lanigan, 2009, p. 590), a 2005 Center for the Digital Future report indicates “little effect on communication and time spent with family” (qtd. in Lanigan, 2009, p. 591). Ironically, however, a 2010 Center for the Digital Future report entitled Parents Souring on the Internet? appears to reverse its 2005 findings stating:

In a worrisome trend, the Center also reports in its 2010 survey that an increasing percentage of parents say Internet access at home is reducing their children’s in-person time with friends. ….Its most recent surveys also confirm the Center’s earlier report of a sharp drop off in family face-to-face time in Internet-connected households, starting in 2007. From an average of 26 hours per week during the first half of the decade, family face time had fallen to just under 18 hours per week by 2010.

Lanigan cites failure to consider family context (Lanigan, Bold, & Chenoweth, 2001, noted in Lanigan, 2009, p. 591), and “individual personality traits” (Swickert, Hittner, Harris, & Herring, 2002, qtd. in Lanigan 2009, p. 591) for these inconsistencies.
Using an on-line survey of 97 families, Lanigan, Bold & Chenoweth’s (2009) research studying “the relationship between home computer use and family communication, cohesion, and adaptability” (Lanigan et. al., 2009, cited in Lanigan, 2009, p. 603) revealed unexpected results compared to current findings. Surprisingly, “the more time families spent engaged with the computer, the higher their level of communication, cohesion, and adaptability” (Lanigan, et al, 2009, cited in Lanigan, 2009, p. 603).

Reiterating the inconsistencies, Lanigan, Bold & Chenoweth (2009) state, “While vast amounts of quantitative data have been collected, no consensus has been reached about how computers affect family time and relationships” (p. 16). They go on to state that “[n]uanced data collected using qualitative methods and guided by a family theoretical framework may be better suited to understanding perceptions of computer impact within family contexts” (Lanigan, Bold & Chenoweth, 2009, p. 16).

Studying cell phone usage, Pratt, Wiseman, Cody, & Wendt (1999), for example, found that while cell phones generally promote family communication, some studies note the “potential to reduce communication content or context … . The disconnect between verbal or textual communication and nonverbal signals can result in misunderstanding” (qtd. in Lanigan, 2009 p. 590). Considering age difference, syntax, perceptions, and communication modes, one can easily imagine how this disconnect could be experienced in grandparent-grandchild communications and consequently misconstrued as issues related to the generation gap. Fox (2000), on the other hand, noted the use of “cell phones to send barrier signals. Family members can avoid family interactions by engaging with the multimedia functions on their cell phones” (qtd. in Lanigan, 2009, p. 590). Lenhart & Madden (2005) found that younger persons use these behaviors to
create privacy while excluding parents from “their interactions and culture” (qtd. in Lanigan, 2009 p. 590). Pervasive cell phone use in the presence of family members was also found to cause family discontent (Lanigan, 2009, p. 590). Again, as media absorbs such information, older adults’ and thus grandparents’ willingness to consider technology may be hindered resulting in negative reactions to grandchildren’s natural embrace of technology or their attempts to engage grandparents in technological exchanges.

Research further reveals conflicts concerning the family’s influence on older adults’ technological learning. Chu (2010) reports that while some research underlines the notion of family support, that from children especially, other research contradicts these findings. Chu discloses statements from contradictory research, stating:

Research has found that encouragement or coercion from children who want their parents to make use of the computer and who provide support are the main motivations for older adults to learn to use the Internet (Johnson, Homik, & Salas, 2008, Selwyn, 2004). On the contrary, Billipp’s (2001) findings revealed that training from a friend or relative increases depression in a vulnerable older sample. Better learning effectiveness occurs when the instruction is provided by professionals (p. 256).

That conflicting research exists in all areas affecting intergenerational communication relative to technology attests to the need for further investigation.

### 2.3 Demographics and Multigenerational Relationships

Aspects of gender, age and family demographics are essential when studying older adults’ adoption and use of technology. Haythornwaite (2001) states that while computer and Internet use is equal between genders, (qtd. in Lanigan, 2009), according to Lanigan et. al. (2001) women are “more likely to use communication functions in ways that enhance family relationships” (qtd. in Lanigan, 2009). Further, Lanigan cites Venkatesh et. al. (2003):
Venkatesh … found that women were less likely to use aspects of technology that were perceived to require extensive effort to master. This effect was further moderated by age; a positive correlation was found between age and reluctance to exert effort to learn new technologies” (Venkatesh, et. al. (2003) qtd. in Lanigan, 2009, pg. 600).

As economic and societal demands evolve, pressures on the elderly to maintain the hectic and often baffling pace increase. Today’s grandparents must adjust to the dynamics of increased longevity, migrating and ever-increasing multicultural families, and the constant-changing culture brought on by new technologies, especially in the arena of intergenerational communication. Grandparents on the threshold of retirement may accept or be thrust into new responsibilities fraught with changing attitudes and ideals—often viewed as outlandish or bizarre—that translate into new realms of communication. Thus, some insight into grandparent – grandchild relationships and communication methods both within and outside the technological arena is fundamental to this study.

2.3.1 **Outside the Technological Arena**

Waites (2007) and Bengtson (2001) explore facets of the multigenerational relationship outside the technological arena. According to Waites, (2007) as increased longevity leads to multigenerational families and greater years of shared lives, the need to nurture intergenerational relationships is imperative. “With increasing life expectancies, grandparents can have relationships with their grandchildren that may last 30 years. …Three or four generations, living concurrently will be more ubiquitous; intergenerational relationships will take on a more significant role in everyday life” (p. 150). Bengtson (2001) concurs stating that the importance of multigenerational relationships will intensify in the 21st century. Citing significant transitions in family
structures and functions, Bengtson (2001) offers the hypothesis of “increasing importance of multigenerational bonds” based on the recent demographic of increased longevity, stating:

*Relations across more than two generations are becoming increasingly important to individuals and families in American society.* Considering the dramatic increase in life expectancy over the past half century, this is not a particularly radical departure from conventional wisdom. But I suggest a corollary to this hypothesis, which I hope will lead to spurted debate: *For many Americans, multigenerational bonds are becoming more important than nuclear family ties for well-being and support over the course of their lives.* (2001, p. 5).

Bengtson’s views are critical to the contemporary grandparent-grandchild relationship, within and without the technological arena, and bear further investigation. Bengtson lays a three-point foundation for his hypothesis arguing that “changes in intergenerational demography—changing age structures resulting in longer shared lives—results in increased “opportunities—and needs—for interaction, support, and mutual influence across more than just two generations.” Further, he notes “the strength of intergenerational solidarity over time and the diversity of cross-generational types”; and third, marital instability has weakened the nuclear family’s ability to provide necessary support, nurturance and socialization. Hence, “kin across several generations will increasingly be called upon to provide these essential family functions in 21st-century society” (2001, p. 5).

Waites (2007) qualitatively explores grandparent-grandchild communication issues. In addition to grandparents’ perceptions as to the quality of their relationship with their grandchildren “in terms of family solidarity” in the areas of emotional closeness, contact, and agreement, Waites also asks, “what do grandparents perceive as barriers to promoting understanding across generations and to fulfilling intergenerational
interactions” (p. 151). Initial conversations and the sampling unit of the present study reflect that of Waites’ research. Waites states:

This paper focuses on those grandparents who are not currently the primary caretaker, but have other roles and relationships with their grandchildren. This might include participatory caring relationships with grandchildren such as babysitting, vacations with grandchildren, transportation assistance, financial support and past caregiving activity. These intergenerational relationships are often ones that older adults talk about with pride but also with concern. (2007, p. 151)

Surveying 27 grandparents, the majority being 75 to 84 years of age, Waites “sought insight and suggestions for developing strategies to enrich intergenerational communication and relationships” (2007, p. 151). Grandparents identified a number of barriers including “some difficulty understanding and feeling comfortable with grandchildren’s pop culture, language and music,” (Waites, 2007, p. 156) and relationship quality issues resulting from household distance. Sixteen of the 27 grandparents surveyed subsequently participated in focus groups of eight each and were asked eight questions. Significant to the present study is the fact that, while these grandparents maintained contact, emotional and family unity barriers exist. “They did not fully understand their grandchildren and the changing environment that impacted their daily lives” (Waites, 2007, p. 161). When asked for “suggestions on how to improve communication and understanding”, grandparents “had difficulty looking specifically at their own issues in communicating with their grandchildren” although noting that “by and large…actual problems were family structure, association patterns, parenting practices and intergenerational contact (Waites, 2007, p. 160). Moreover, “[b]oth focus groups struggled to come up with strategies to enhance intergenerational relationships” (Waites, 2007, p. 160). Generally speaking, the grandparents were
unenthusiastic regarding intergenerational participation. One grandparent replied that “Teens … would not have the patience to sit down and teach me how to use the computer. …” (Waites, 2007, pp. 160, 161). One younger respondent, however, voicing optimism suggested activities to promote intergenerational understanding (Waites, 2007, p. 161).

2.3.2 Within the Technological Arena

While focus groups in Waites (2007) struggled to identify strategies to enhance relationships, Ward and Smith (1997) offer strategies using information technologies to narrow the gap. Research conducted by Ward and Smith (1997) serves as a basic element to this study as it explores intergenerational communities and reasons why technology both enhances and thwarts communication between generations and thus grandparents and grandchildren. Identifying technology “as only one aspect of contemporary society that promotes and also limits the development of intergenerational community” (1997, p. 38) Ward and Smith delineate older adults’ needs that can be ameliorated through technology and communication with younger generations including life review and legacy, and the need to remain actively connected.

As the elderly, and in the case of the present study grandparents, reflect on the events, pursuits and interests that formed their lives, a key factor in this review process is an assessment of one’s life from the perspective of continuing relations with successors and information technologies “offer unparalleled opportunities for older adults to review the vast differences between the contemporary world and that of their childhood and to share the meaning of these differences” (Ward and Smith, 1997, p. 39). Moreover, the need to leave something behind increases with age. Digital restoration, retrieval and
storage now provide easier access to previously cumbersome family photo albums and videos. In addition to grandparents’ personal experiences, milestone public events that occurred during their lives can now be shared with grand- and great grandchildren. “Historical, genealogical, and demographic data can help older adults fit their experiences into a larger historical context,” to their own benefit and that of their grandchildren and future generations” (Ward and Smith, 1997, p. 39). Isolation often occurs as physical distance separates families. Not only does advanced technology modernize familial communication, but it can also support friendship development as well. Email facilitates intergenerational connections thus removing geographic barriers. Contrary to the impersonal images of email communication, many experience a closeness similar to that of other written exchanges. Email, and now Skype or Webcams are exceptionally suited for maintaining “a focused, ongoing correspondence with grandchildren … who may feel they have no real time to get full attention in the hectic pace of a family reunion or in the rush of a long distance family telephone call” (Ward and Smith, 1997, p. 39).

2.3.3 Meeting Reciprocal Needs via Technology

Ward and Smith similarly explore advanced technologies that meet younger generations’ needs including nurturing and cultural understanding. Advanced technology provides not only immediate and flexible exchange of familial information and materials but thoughts and ideas as well. Intergenerational programs foster connections through learning and skill-building exercises. Children, and in the case of this study grandchildren, who are more tech savvy than their grandparents function as teachers
while grandparents in turn “bring nurturing and other skills and qualities to these mutual learning sessions” (Ward and Smith, 1997, p. 40).

As legacy building is important to elders, so is cultural learning important to children, and while one may argue that such information is readily available through a number of mediums and instructional opportunities, the learning is certainly more perceptible and meaningful when supplemented by members of one’s own family sharing actual events and experiences (Ward and Smith, 1997, p. 40).

2.3.4 Negative Effects of Technology on Intergenerational Relationships

But as useful as advanced technologies can be in fostering intergenerational communities, Ward and Smith (1997) point out potential negative effects and circumstances of IT (Information Technology) as well, including disadvantages caused by speed and complexity of technology, an imbalance in generational training and learning experiences relative to technology, generational disconnect and isolation caused by technological self-absorption. Technology can negatively affect intergenerational communities as well. While employment in information technology may not be the immediate reason for relocation, the fact that technology removes the need for specified work locations necessitates generational migration. Although new products and societal change is not novel, the speed and complexity associated with technological advancement may prove difficult for older adults to comprehend and stay abreast. New technologies can act as an intergenerational barrier when familiarity is not common to multiple generations. As work and school remain as the primary learning modes for technology, older generations are left at a disadvantage. Finally, affluence and relatively low cost of technical artifacts fosters a shift from familial to individual focus of interests resulting in
generations seeking out parallel interests and age groups via technology (Ward and Smith, 1997).

Ward and Smith (1997) conclude that changes in public policy are necessary to eliminate rifts and foster intergenerational communities. Older adults must be empowered to the same degree as younger generations in their access to technology. Public policy must recognize that funding and not age is the most “formidable barrier to widespread use of many technologies” (Ward and Smith, 1997, p. 42).

2.4 Grandparents’ Ownership, Access, Usage, Skill Levels

A myriad of circumstances may influence older adults’ ownership, access, usage and technological skill levels. For example, while younger populations and even “Younger Boomers and Older Boomers”, ages 47 through 65 (Zickuhr, 2011, p. 5) derive much of their social interaction and thus instruction from the workplace, the “Silent Generation” and the “G.I. Generation”, ages 66 through 75+(Zickuhr, 2011, p. 5) in particular, may have left the work environment before the arrival of technology for everyday use.

Lanigan (2009) notes that adoption of a technological device by a family member encourages other family members to do the same. Moreover that “[c]hildren serve as the catalyst for computer adoption in the home …” (p. 600). Olson et. al. (2011) caution that in the case of older adults especially, “[t]echnology usage should not be simply defined in terms of a user or non-user” (p. 126). Differences in use may reflect self-efficacy, but may also “relate to more fundamental differences that can help predict whether a new technology would be adopted by older adults in general or by a specific person” (Olson et. al., 2011, p. 126).
Quadrello et. al. (2005) explore an interesting aspect that technology brings to the communication arena—compensation vs. accumulation—“a pattern of contact where different forms of communication co-vary with each other …” (p. 200). Noting that “[n]ew forms of communication such as mobile phone calls, SMS and email are also spreading among older groups of the population, but there are no available data on contact between grandparents and grandchildren via new communication technologies” (p. 201), Quadrello et. al. (2005) use accumulation and compensatory models to explore whether technological forms of communication compensate for more traditional forms of contact when grandparents communicate with grandchildren, or whether accumulation patterns of communication prevail. Their investigations revealed that “traditional forms of contact accumulate to each other, as do new forms of contact (SMS and e-mail)” (Quadrello et. al., 2005, p. 206). Grandparents who see grandchildren often contact them often by landline or cell but not through email or texting, while grandparents who text often also email often. Overall, Quadrello, et. al. (2005) find a minority of grandparents adopting new communication modes with grandchildren; further, that availability or familiarity with the medium does not correlate with usage, positing that for older adults in particular, strong incentives and educational experiences are important adaptation factors. They note that “investigating the attitudes of older people to new technologies, and the gratification opportunities they may find in their use, generally, and with those grandchildren old enough to use them and who have grown up with these opportunities” (Quadrello, 2005, p. 206) bears further study. These results relate to commentary in Selwyn (2004, Information aged):

Received wisdom has it that ICT is transforming all aspects of society—from civic involvement to the arts, employment to leisure. Thus, as the UK
government has been prone to proclaim, using information technology is nothing less than ‘the indispensable grammar of modern life’ for all adults. (Wills, 1999, qtd. in Selwyn, 2004, Information aged, p. 369)

Selwyn (2004) goes on to state that this societal and civic imperative has initiated world-wide political efforts to guarantee every citizen basic “universal access” to IT; further that inconsistencies be reduced between ICT using segments of society and non-users. Moreover, that media is beginning to recognize that the information society is also an aging society (Bernard & Phillips, 2000 qtd. in Selwyn, 2004, Information aged, p. 370) and that encouraging older adults’—defined as over age 60, use of ICT is an essential prerequisite to overcoming the ‘digital divide” (Selwyn, Information aged, 2004, p. 370).

Selwyn goes on to delineate unanswered questions regarding older adults and ICTs, stating that “despite the increasing political, academic, and practitioner interest in older adults and technology,” (p. 370), little is know about motivations and reasons to (non)adopt, about the nature of use and support called upon, “and perhaps most importantly, … little about the outcomes of older adults’ (non)use of ICTs” (Selwyn, Information aged, 2004, p. 370).

While surveying 1001 adults and then conducting semi-structured in-depth interviews of 100 adults from the initial survey, Selwyn focuses on interview data collected from 35 participants over 60 years of age. In terms of older adults’ acquisition, Selwyn’s data reveals that various social and informal methods—often a family recycling process, are used to acquire technology, “most notably, … the extended family, usually in the form of children and younger relations who were also using computers” (Selwyn, 2004, Information aged, p. 373, 374); moreover, that this acquisition method is not confined to lower income or economic groups. “Given the rapid “hi-tech” obsolescence
of computers, older adults were often at the end of such recycling chains, with knowledgeable younger family members ‘setting them up’ and ‘sorting them out’” (Selwyn, 2004, Information aged, p. 375). Reasons for nonuse among interviewees were practical—cost, lack of workplace exposure, while some involved with other activities and pastimes simply were uninterested in computer use. Selwyn points out the significance of older adults’ perceptions of the computer as another hobby to consider rather than a life tool. When one considers younger generations’ view—perhaps even belief of technology as an indispensible life tool, one can easily conceive a generation gap or digital divide. Selwyn further points out that lack of knowledge, skills or opportunities is not always a reason for non-use; rather, older generations are comfortable and familiar with traditional forms of research; many who used computers in their work life choose to move away from usage, while others simply have other interests.

Having explored the whys and why-nots of computer usage among older adults, Selwyn then considers the life-fit of technology, and concludes that most older adults use computers for specific reasons as opposed to high frequency, all purpose use. Selwyn resolves that categorizing between “nonusers” or “silver surfers” (p. 380) is misleading; that older adults’ use tends toward the simple and ordinary, and is not governed by access or ability; that it mainly occurs at home and any support received is from immediate family and relations. Further, that influences of (non)use are complex and historical and that older adults “move through different states or levels of technology (non)use depending on their circumstances and context” (Selwyn, 2004, Information aged, p. 380). This revelation is important for the argument that technological nonuse is a “generational” consequence that would disappear as the computer-using workforce
reached older age (Selwyn, 2004, Information aged). Selwyn attributes older adults’ nonuse to an ambivalence and irrelevance created by contradictions—media and political portrayals of technology as inherently empowering, while in effect personally experiencing limited advantages from technology in daily life (Selwyn, 2004, Information aged).

Selwyn’s study of (non)use is valuable for purposes of studying the grandparent-grandchild relationship in terms of technology. As stated earlier, media hype disillusions rather than enchants the aged individual, thus one can speculate that when basic viewpoints toward a medium are oppositional, tangible needs and logical reasoning must be met and life-fit circumstances must be in place before cooperative usage can begin. Moreover, older adults and thus grandparents are not born to technology, but rather need a reason to adopt the medium and its devices. The grandparent-grandchild bond combined with grandparents’ intense interest in their grandchildren’s well-being, activities and overall communicative relationship may be the circumstance or context in which grandparents embrace the medium, and the perception of the digital divide withers.

2.5 Learning Methods, Interaction, and Satisfaction Levels

Examining the family unit as a learning environment for older adults’ adaptation to cell phone use, Mori and Harada (2010) studied eleven households divided into two groups, one comprised of participant and a spouse, and the other including grandchildren. Mori and Harada question how much learning actually occurs using formal methods such as manuals or courses, and state that “little research has addressed the problems that are related to the ways in which people learn to use technologies in their daily lives” (2010, p. 245). Moreover, minimal research has studied how older adults gain technological
know-how, or how the family unit affects older adults’ learning of new technology. Mori and Harada (2010) posit “a major factor for older adults in learning to use technologies may be whether or not they live with the family members of younger generations,” (pp. 245, 246). To support this hypothesis, Mori and Harada cite their 2007 research that indicates “the presence of family members such as grandchildren in the household of older adults strongly affected their learning to use mobile phones” (2010, p. 246). The 2010 research findings “revealed a significant difference between the two groups, suggesting a rapid learning of basic functions and learning of advanced functions in the participants in the grandchildren group” (Mori and Harada, 2010, p. 251). Mori and Harada further state:

More interestingly, there were also significant differences in the functions that are not always used for communication: taking photos and changing internal settings. This suggests that learning how to use mobile phones can be facilitated not only by the desire to have communicative interactions with family members, but that this learning is also facilitated by the social environment of users, such as family structure, which may be mediated by environmental factors that affect the possibility of receiving effective social support for learning novel artifacts (2010, p. 252).

Mori and Harada’s research serves as a strong support of the hypotheses of the present study—that technology can contribute to grandparent-grandchild relationship enhancement, that grandchildren play significant roles in grandparents’ acquisition of technological know-how, and that grandparents derive satisfaction from the interactive experience. Mori and Harada’s research discusses the roles of individuals as “model user of technology” and “continuous giver of direct and timely support for the learning of operations” (2010, p. 252) and notes “all support for the learning of operations that was reported in the participants’ diaries … was provided by family members living together
with the participants …” (2010, p. 252). Mori and Harada also emphasize the “social environmental factor” in facilitating skill acquisition associated with family structures that include the presence of grandchildren:

What is necessary is greater attention to, and discussion of, ways to increase the availability of social or environmental support systems for an aging society. In fact, the number of older adults who live with grandchildren continues to decrease, meaning that currently the real problem entails figuring out how to provide effective social support to older users who are living only with a spouse (30% of total households with elderly people in Japan) (2010, p. 253).

“[W]ith gender and age as moderators” Chu (2010, p. 257) investigates the importance of tangible, identified as information and facilities, and emotional family support and “Internet self-efficacies on older adults perceptions of the effects of e-learning” (p. 257). “Perceiving little family support and lacking self-confidence and motivation … have been identified as reasons for keeping older adults out of learning and using information technology (IT)” (Chu 2010, p. 255). Surveying 290 adults aged 50 and older who participated in e-learning classes to measure “perceived learning, intent-to-persist in e-learning, and learning satisfaction,” (2010, p. 258) Chu concludes that “emotional family support has a direct influence on older adults’ perceived effects of e-learning. Compared to middle age adults, older adults rely more on tangible family support …” Further, that “[f]amily encouragement enhances higher aged adults’ general and communication Internet self-efficacy, and leads to better e-learning outcomes” (p. 263). Of particular interest, Chu’s research in discussing gender differences states “compared to men, the motivation to learn with e-environment is relatively higher for older women when young children are present in the family” (Chu, 2010, p. 257). Chu reflects on Vandenbroeck, Verschelden, and Boonaert (2008) who surveyed 551 female daycare providers to study anxiety, motivation, and social support relative to the digital
divide, and state that in addition to motivational factors, “…children may represent an important form of social support for women not yet using computers. … the concerns about the gender gap in computer use may benefit from taking the scaffolding possibilities of the family into consideration …” (Vandenbroeck, et. al., 2008, p. 181). The factors of anxiety, motivation and social support can certainly apply to not only women who have not yet experienced computer usage, but the ranks of the older elderly in general, grandparents included.

2.6 Grandchildren’s Usage and Roles in Information Communication Technology

Using surveys followed by interviews, Selwyn (2004, Exploring the role) investigates children’s roles in adults’ purchase and/or acquisition of computers, adults’ access to technology, the nature and level of adults’ (non)use of technology, and their roles in adults’ learning and support. From the standpoint of the present study, Selwyn’s research appears to attempt to find a common ground between perceptions of children as dominating controllers of the medium and adults as passive technological novices. Although children were significant in (grand)parents’ decisions to acquire computers, children were not the sole reason for purchase or adoption of computers. Regarding the use of and access to ICT, again children played a justifying, but not central role in decisions. Finally, regarding learning and support, “children appear to play a peripheral role in adults’ use of ICT—exerting, if anything, more influence on grandparents’ engagement with technology …” (Selwyn, 2004, Exploring the role, p. 67). Selwyn reports that despite the complex reasons elicited in interviews, parents and grandparents’ use of children’s desires and perceived needs of ICT as reasons to purchase or adopt
technology is often a conforming response to political and economic efforts to construct social norms of technological and information societies. And while Selwyn’s research revealed examples of domineering as well as technologically helpful youngsters, Selwyn cautions that “it would be sensible to avoid homogenous assumptions that children are either ‘leading adults into the information age’ or, conversely, preventing adults from accessing and using ICT” (Selwyn, 2004, Exploring the role, p. 67). Selwyn concludes that children are realistically a single element in adult ICT usage, thus challenging contemporary notions of children as technologically ubiquitous. Selwyn posits, “The notion of children as ‘ambassadors’ or conduits for the information age appears to be more complex and convoluted than policymakers may assume” (2004, Exploring the role, p. 69), and stresses a political strategy to incorporate ICT in everyday life at all age levels rather than focusing on children as a filtering system of technology to adults (Selwyn, 2004, Exploring the role).

2.7 Grandparent-Grandchild Relationship Enhancement

Moore (2009) cites Field and Minkler (1988) who state that the contact between adult grandchildren and grandparents diminishes when grandchildren leave home. While grandchildren think fondly of their grandparents, visits and communication are rare. Technology has altered this position. Describing instances of long distance grandparent-grandchild technological interaction and communication—online Scrabble via an iPad, video chatting via Skype, “friending” great-grandmother on Facebook—Baker (2011) reminds us that grandparents and grandchildren have a great deal in common—“free time, disposable income for gadgets and gizmos, and a keen interest in staying in touch with people”, while technological innovations “have made sharing fun rather than
frustrating. It’s a perfect storm of demographics and technology” (Baker, 2011, no page cited).

Tee, Brush & Inkpen (2009) examine factors and nuances of intergenerational relationships, exploring “how technology can help extended family members (people who are related, but do not live in the same household) maintain a sense of connectedness, defined by Romero et al. (2007) as a ‘positive emotional appraisal, characterized by a feeling of staying in touch with ongoing social relationships’ (Romero qtd. in Tee, Brush & Inkpen, 2009, p. 128).

Interviewing 28 northwestern United States parents and grandparents questioning how they conduct extended family communication, share family photos and event news, the types of information they wish to share, and whether existing technologies are satisfying their needs, Tee, Brush & Inkpen evaluate patterns, challenges and other factors affecting extended family communication. Tee, Brush & Inkpen’s research is vital to this study because of its basic demographic similarities, but more importantly because it explores generational differences in technology use while at the same time delves into the social nuances of extended familial communication from a technological standpoint. Building on this information, they suggest design considerations for improving ICT.

Although most participants in Tee, Brush & Inkpen’s study wished to increase communication, social or technological concerns including obligatory pressure, pride, and guilt came into play. While acknowledging technology as a communication resource, Tee, Brush & Inkpen emphasize the need for designers and researchers to
consider the complexity of communication dynamics when designing technological devices aimed at supporting and enhancing relationships, stating:

In particular, our findings suggest that new technology must delicately balance the assistance it provides without creating additional burdens or obligations, while at the same time being easy to use without trivializing the interaction (2009, p. 129).

Although interviewees agreed that technology greatly facilitates not only communication, but also media and information sharing as well, interviews nonetheless revealed a number of technological and social challenges. Technological challenges included slow connections, limited storage space, and related technical problems, and fear and or perceived irrelevance of the medium. Of particular interest was the fact that study participants were quite aware of extended family members’ technical abilities and equipment, and sensitive to these limitations when corresponind. Social challenges in initiating correspondence included feelings of guilt for sporadic communication, perceptions of bragging and overload, and creating feelings of unfairness if communicating with one extended family member more than another. Feedback was an important factor in technological communication. Expressed interest in photo sharing generated more technological input effort, while lack of appreciation and slow or negative feedback resulted in diminished efforts. (Tee, Brush & Inkpen, 2009) When considering that these anxieties occur at any generational level and in any form of communication, one can appreciate potentially heightened levels of angst when technological know-how and generational differences come into play. Moreover, positive and negative elements of feedback would certainly seem to have an effect on older generations and thus grandparents’ desires to embrace technology.
Chapter 3

Methodology

3.1 Sampling Unit

The purpose of this cross-sectional study is to gather data and opinions of a target population, specifically grandparents, or seniors who have a familial relationship with children. The Area Office on Aging Northwestern Ohio, Inc. is the primary source of the sampling unit. This agency’s website lists non-residential senior centers and senior dining sites in Northwestern Ohio counties. Preliminary research influenced the researcher’s decision to visit non-residential senior social centers. Mori and Harada (2010) targeted a Tokyo senior social resource center, and Waites (2007) visited three senior centers in two North Carolina counties. To gain access to large numbers of seniors and thus potential grandparents, the researcher chose to target non-residential senior centers, limiting the demographic scope to Toledo, Ohio and surrounding communities. In preliminary surveys of older adults followed by personal interviews, Selwyn (2004, Exploring the role), “specifically wished to elicit the voices of individual adults” and thus conducted interviews outside “the presence of other family members” (p. 56). To avoid possible interaction from family members or other persons at residential sites or other sites where outside influence might occur, the researcher chose to visit non-residential
senior social centers. Further, because varied attendance at different social activities, e.g., dances, exercise sessions, cookouts, is anticipated, the researcher chose to visit senior centers rather than dining sites. To ensure a culturally diverse population, the researcher targeted senior centers spanning Toledo area and surrounding communities, specifically those located in Lucas and Wood counties. The researcher contacted directors of seven senior centers, one of which referred the researcher to Kinship Navigator, a program of the Area Office on Aging of Northwestern Ohio, Inc. for access to grandparents and others who are raising relatives’ children. Of these eight contacts, the follow six non-residential senior centers have consented to allow the researcher to conduct surveys at their respective sites:

<table>
<thead>
<tr>
<th>Zablocki Senior Center</th>
<th>Eleanor Kahle Senior Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>3015 Lagrange Street</td>
<td>1315 Hillcrest Drive</td>
</tr>
<tr>
<td>Toledo, OH</td>
<td>Toledo, OH</td>
</tr>
<tr>
<td>Jim Gramza, Executive Director</td>
<td>Cathy S. McVicker, Exec. Director</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perrysburg Senior Center</th>
<th>Friendship Park Community Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>140 West Indiana</td>
<td>3930 131st Street</td>
</tr>
<tr>
<td>Perrysburg, OH</td>
<td>Toledo, OH</td>
</tr>
<tr>
<td>Nedra S. Obreiter, Manager</td>
<td>Greg Holewinski, Director</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rossford Senior Center</th>
<th>Margaret L. Hunt Senior Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 Dixie</td>
<td>(South Toledo Senior Center)</td>
</tr>
<tr>
<td>Rossford, OH</td>
<td>2121 Garden Lake Parkway</td>
</tr>
<tr>
<td>Mary L. Tebbe, Site Manager</td>
<td>Toledo, OH</td>
</tr>
<tr>
<td></td>
<td>Lynda Lisk, Director</td>
</tr>
</tbody>
</table>

Finally, the researcher’s initial conversations that led to this study were with grandparents aged late 50’s to early 60’s and who are still engaged in their life-career daily employment. Wishing to gain insight into the attitudes and opinions of a greater age span of grandparents, the researcher conducted the senior center surveys during the normal working hours of the day, 9:00 am to 5:00 pm. Thus, the researcher presumes
that seniors in the younger age categories, less than 50 and up to 75 years of age to have had at least some exposure to technology through the workplace, and as such, are amenable to, and perhaps socially expected to accept technology into their lives. Conversely, those 75 years of age and older may have experienced limited exposure to technology in the workplace. Thus, as Ling points out, “while no efforts should be made to exclude them from using the technologies, it is not reasonable to expect that large numbers of the elderly from [the older elderly] cohort will ever become users of the technology” (Ling, 2008, p. 334).

3.2 Senior Center Contact and Survey Process

The researcher made initial phone contact with respective center directors followed by a personal visit at which time the directors were presented with a letter introducing the researcher, explaining the project and detailing the procedures, a sample survey, and a pre-drafted letter granting permission to visit the centers. Upon consent of center directors to participate, approval was gained to visit the sites in accordance with the University of Toledo Department of Human Research Protections. As participation is anonymous, the researcher will petition for Waivers of Consent for participants.

As stated above, the researcher sought participation of up to six senior centers with a maximum of 300 participants. The surveys were numbered, however participants were not identified. The researcher collected completed surveys at each visit. The researcher did not solicit additional information from participants; however, if participants chose to discuss questions or subject matter subsequent to completion of the survey, the researcher recorded notes. Notes were attached to respective surveys and completed surveys were placed face-down in a collection box. Seating was provided for
the researcher at one side of a table and for two participants at the opposite side. If participants visited the researcher’s table in groups of two and group discussions ensued, the researcher duly recorded such interaction. Only information relative to survey material was recorded and any shared information irrelevant to the study was not recorded or was deleted from the record. Completed surveys were secured in the researcher’s possession.

3.3 Questionnaire – Overall Structure

Consideration for the audience age span is of paramount importance in constructing the questionnaire. Because the anticipated audience is primarily over the age of sixty and this population may feel more vulnerable and skeptical of volunteering written information, the questionnaire is anonymous. In addition, a formal introduction page introducing the researcher, providing the purpose and title of the survey, inviting participation and thanking participants, and providing contact information precedes the survey questions.

Comprised of 25 open-ended, Likert scale, and yes-no questions, the survey begins with simple instructions for answering questions and invites participants to add comments or anecdotal information if desired. The survey is structured to build an image of participant’s overall involvement and attitude toward technology and specifically as it pertains to the grandparent-grandchild relationship. The questionnaire first gains background information on participants and their grandchildren. Building on this data, it then determines grandparents’ technological access, usage and skill levels. The crux of the study is gleaned from the next set of questions that query grandparents’ technological learning methods, interaction, and satisfaction levels. Final questions regard
grandparents’ perception of grandchild(ren)’s technological ownership and usage, and whether grandparents believe technology has enhanced their relationship with their grandchild(ren). The survey concludes with an invitation to share other thoughts or concerns about technology and its effect on the grandparent-grandchild relationship.

3.3.1 Basis for Survey Questions

Survey questions are based on the researcher’s past personal experience, initial conversations with grandparents of the researcher’s acquaintance, consultation with colleagues and mentors, current trends and observations, and major studies in the field. An AARP and Microsoft report entitled *Boomers and Technology: An Extended Conversation* (Rogers, 2009) influenced the tone of this survey. This report initiated with dinner conversations of “more than 60 Baby Boomers” in four major cities, New York, Chicago, Phoenix, and San Francisco who “talked into the night, sharing their thoughts, enthusiasms, frustrations and hopes about what modern technology means to them. Those conversations, … were striking both for their frankness and for revealing the thoughtful and complex relationship this generation has with technology” (Rogers, 2009, p. 3).

Although not specifically concerned with technology, Waites (2007) research consisted of “twenty questions designed to obtain basic descriptive information and explore intergenerational relationships and issues. In particular, the survey sought to explore how older adults perceive their relationships with their grandchildren and issues that concerned them.” This study mirrors a number of Waites’ questions but with a technological focus.
A number of questions in the present study’s survey reflect Selwyn’s (2004, Information aged) open-ended questions that inquire as to (non)use of computers in the home or workplace, community computer resource and social network use or nonuse, and respondent’s views on society and technology.

### 3.3.2 Personal and Familial Information

The questionnaire begins with personal and familial inquiries. The age range of the participant is of paramount interest as a fifty-some-year old grandparent may have very different viewpoints and knowledge relative to technology along with connective means to his/her grandchildren than that of an eighty-plus year old grandparent. Ling (2008) differentiates between the elderly, and the “older elderly,” (p. 334), while the Pew Internet Project in it’s report *Generations and Their Gadgets* (Zickuhr, 2011) makes distinctions between the elderly as “Younger Boomers”, ages 47-56, Older Boomers, ages 57-65, Silent Generation, Ages 66-74, and G.I. Generation, Age 75+. The report differentiates “between Younger Boomers and Older Boomers because enough research has been done to suggest that the two decades of Baby Boomers are different enough to merit being divided into distinct generational groups” (Zickuhr, 2011, p. 5). Ascertaining participants’ gender is also of interest in determining whether grandmothers or grandfathers maintain more contact with grandchildren, and in what manner. Lanigan (2009) cites Lanigan, et al (2009) stating, “gender appears to affect how technology is used. Women were more likely to use communications functions in ways that enhance family relationships” (Lanigan, et al, 2009, qtd. in Lanigan 2009, p. 600). Participants’ living status is also relevant to study results. While visiting a senior center indicates participant’s desire or need to interact with others, determining participant’s living status
and thus level of independence may influence participant’s ability to interact with grandchildren, and thus lends weight to subsequent questions.

Whether to request the number and ages of all grandchildren or to request that participants focus their responses on their relationship with a single grandchild was a point of considerable deliberation. After discussion with colleagues and mentors, the researcher chose the random sample approach requesting that participants focus on all grandchildren as a unit. During the initial conversations leading to the study, grandparents referred to their numerous grandchildren as a single unit when voicing their observations and concerns. Moreover, for the purposes of a twenty-minute survey, expecting grandparents to focus their thoughts and observations to a single grandchild seemed unreasonable. The literature appears to support this decision. Discussing data collection from older adults, McAdams (1998), states, “people’s use of technology is a complex and ‘messy’ affair” (qtd. in Selwyn, Exploring the role, 2004, p. 56); further, Elnick et al., (1999) states that “Indeed, the family and children are seen as particular ‘benchmark memories’ in adulthood … ” (qtd. in Selwyn, Exploring the role, 2004, p. 56), and thus, according to Selwyn, “much of our interview data, therefore, are likely to be sanitized and rehearsed accounts” (Exploring the role, 2004, p. 56).

The last three personal questions determine participant’s daily access to grandchildren, and the means by which communication and interaction with grandchildren occurs, crucial factors when weighing the necessity and/or usage level of technological communication devices. Interviewing 28 parents and grandparents of extended families, Tee, Brush and Inkpen (2009) questioned how often and with what methods they communicated, and levels of satisfaction with the amount and type of
communication. Likewise, one of Beckenhauer and Armstrong’s (2009) five key questions of twenty adults age 60 and older was “What are your favorite ways to communicate (face-to-face, telephone, letters, e-mail)?” (p. 827). Lanigan (2009) cites Lanigan, et. al., (2009) stating that “…the geographic proximity of [family] members, influences the use of ICTs [Information Communication Technologies]” (p. 600).

Finally, like Selwyn (Exploring the role, 2004), this study is limited in that it lacks views and information from the grandchildren’s perspective. Selwyn’s decision in this regard was deliberate, “given what was felt to be the (over)privileging of children’s voices in previous studies in this area” (p. 56). Likewise, the researcher’s interest is in the grandparents’ perspectives.

3.3.3  Grandparents’ Technological Ownership, Access, Usage, Skill Levels

A number of Pew Research Center reports, Americans and their Gadgets (Smith, 2010), Generations and their Gadgets (Zickuhr, 2011), Technology and Social Networks (Hampton, Goulet, Rainie, and Purcell, 2011), Americans and their Cell Phones (Smith, 2011), Older Adults and Social Media (Madden, 2010), and Cell Phones and American Adults (Lenhart, 2010), are the basis for questions 8 through 13 that deal with grandparents’ ownership of or access to computers, ownership of other technological devices, their reasons for acquiring these devices, their skill levels on the respective devices, and whether they have established social media accounts.

3.3.4  Technological Learning Methods, Interaction, Satisfaction Levels

Questions 14 through 22 concern ways in which grandparents learn to use technological devices, which devices, if any, grandchildren aided grandparents in
learning, grandparent/grandchild technological interaction, and learning outcomes and satisfaction levels.

Davis, Vetere, Francis, Gibbs and Howard (2008), and Vetere, Davis, Gibbs and Howard (2009) explore the nature, methods and opportunities for technological intergenerational play. Discussing the digital divide in terms of a generation gap, Aarsand (2007) explores the notion of grandparents positioning themselves as technologically inexperienced to gain playtime with their grandchildren. Delineating Internet training tools relative to older adult learners, Cody, Dunn, Hoppin and Wendt (1996) include “training that involves high participant involvement and hands-on experiences, …cooperation between mentor and tutor …who help one another and explore new technologies together, … and maintenance of rewarding experiences between individuals who work together to learn and use new technologies” (p. 271). In most recent literature discussing technological interaction between grandparents and grandchildren, Baker states that instruction goes both ways; moreover vast technological improvements “make the new toys the perfect middle ground for the generations to share their curiosity and expertise” (Baker, 2011, no page). Question 14 asks how the grandparent learned new technologies, and questions 15, 16 and 19 inquire as to devices the grandparent or grandchild taught each other to play, and at whose request. Questions 20 and 21 ask “If your grandchild wanted to show you things that he/she learned on a computer or device, would you be interested in watching or knowing?”, and “If your grandchild wanted you to play games or use other technological devices together, would you be willing or interested?” Chu (2010) measured “perceived learning, intent-to-persist in e-learning, and learning satisfaction” (p. 258). Questions 17 and 18 ask, “How much
or how well did you learn?”, determined as follows: “All I wanted to know, Everything he/she tried to teach me, Average amount, Very little, and Nothing at all. Next, using a Likert scale, this survey asks “Did you enjoy the time spent?” and “Did your grandchild enjoy the time spent?”, and allows for additional explanation.

3.3.5 Grandchildren’s Technological Ownership and Usage

A Kaiser Family Foundation report, *Generation M*: Media in the Lives of 8- to 18-Year Olds (Rideout, 2010), is the basis for questions 23 and 24 that concern grandchildren’s ownership and/or access to technological devices and, from the grandparent’s perspective, the amount of time grandchildren spend on these devices daily. A Likert scale is used to rate the amount of time.

3.3.6 Relationship Enhancement

This study researches whether or not technology can be used to enhance the grandparent-grandchild relationship, and can grandparents benefit from their grandchildren’s knowledge and seeming fixation with technology. The final question of the survey asks, “Do you feel that technology has enhanced your relationship with your grandchildren?”

Baker (2011) states:

Certainly it’s nothing new that kids are plugging in and staying connected. But what is new is that it may be a grandparent on the other end of that virtual tin can—and that technology is bridging the vast age and distance gap that has long divided the generation (no page cited).

3.3.7 Anecdotal Information

Selwyn (Exploring the role, 2004), states that “survey data alone do not allow us to gain a deep understanding of adults’ use of computers and, in particular, the influence of family and household dynamics” (p. 55, 56). Selwyn’s research expands from
preliminary surveys to individual interviews of a number of the respondents. Because the anonymous participation factor, time constraints, and open visibility structure of the present study precludes follow-up interviews, a number of questions request anecdotal information and the questionnaire concludes with an invitation to the grandparent to share additional thoughts or concerns about technology and its effects on participant’s relationship with his/her grandchild(ren). Beckenhauer and Armstrong’s (2009) study likewise employs a semi-structured format that includes open-ended questions and concludes with a “Wrap-Up Qualitative Question” that asks: “Is there anything else you would like to add about communication, quality of life, or aging?” (p. 838). While the statistical information is obviously necessary and significant to form conclusive evidence, it is in these responses that participants may share their true outlooks. Although limited in space for response, the requested narrative information nonetheless lends credence to the statistical data, but more importantly aids in constructing an image of the participant’s overall perspective, and thus provides the essence of the study.

3.4 Analysis Method

To test the hypotheses delineated in Chapter 1, this study compares findings in key studies and statistical data with survey results, and further analyzes conflicting research data. As stated earlier, using a spreadsheet format, survey results were tallied solely by the researcher. Each question was represented by a line allowing for each potential answer or box. Columns were created for each respondent. Results of questions were summed by number of respondents, percent of respondents to each question, and percent of number responded, for example: Question 2: Gender. Based on for instance 25 respondents, 19 females, 6 males; 100% overall response; 24 percent
male, 76 percent female. For questions based on the Likert scale, for example, cell phone usage skill level of 1 to 5: results tallied overall total of scores, number of respondents reported, percent of number reported, average skill level based on number reported, and skill level based on average of 5.

Survey results were shared only with the principal researcher and in the context of the study paper. Only the names of the centers were revealed in the study; no reference was made to number of surveys collected at each respective center.

Anecdotal information was also relayed and discussed relative to relevant research and opinions found in current media.
Chapter 4

Results

4.1 Response Methods and Likert Scale Use

A number of questions use the Likert scale, however not all participants answered these questions numerically on a 1 to 5 scale, 5 being high, but instead checked the answer merely indicating the affirmative. In tallying the answers to these questions, the total number of respondents to each factor is reported in number and percentage to total respondents to the question. Respondents using the Likert Scale are reported in separate columns.

4.2 Personal and Familial Information

Seventy-six participants from four of the six senior centers petitioned participated in the survey process. The remaining two senior centers from which consents were obtained were subsequently unavailable to schedule times in which to conduct the surveys. The participating senior centers were Eleanor Kahle Senior Center, Toledo, Ohio, Perrysburg Senior Center, Perrysburg, Ohio, South Toledo Senior Center, Toledo, Ohio, and Zablocki Senior Center, Toledo, Ohio. Survey respondents range in age from under 50 to over 85 years of age, as follows: 1% each under 50 years and between 51-55 years of age, 7% from 56-60 years of age, 17% in the 61-65 age bracket, 11% from 66-70
years of age, 20% between 70-75 years of age, 13% from 76-80 years of age, 16% in the 81-85 age range, and 14% are over 85 years of age. Fifty-nine female and 16 male respondents reported a total of 504 grandchildren ranging from 1 month to 51 years of age. Great-grandchildren, the number of which cannot be ascertained, are also reported ranging from four to 19 years of age. Eighty percent of respondents own their own home, 3% participate in assisted living, and 8% respectively rent or reside in senior housing complexes. Sixty-eight participants report that 229 grandchildren (45% or 3.4 per household) live within grandparents’ driving distance.

4.3 Grandparent and Grandchild Communication Methods

Using a 1 – 5 Likert, 5 being most frequently used method, questions 6 and 7 query how grandparents communicate and share time with their grandchildren. Ninety-three percent of participants answered questions 6 and 7, reporting on 16 methods of communication and time-sharing as delineated in Table 4.1. As noted above, not all respondents used the Likert scale. Percentages are based on number of respondents to the questions.
Table 4.1  Ways in which grandparents communicate and share time with grandchildren.

<table>
<thead>
<tr>
<th>Overall Response</th>
<th>Likert Results</th>
<th>Overall Response</th>
<th>Likert Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>% Respondents</td>
<td># Respondents</td>
<td>Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td>In person</td>
<td>92%</td>
<td>23</td>
<td>Mail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.04</td>
<td></td>
</tr>
<tr>
<td>Landline</td>
<td>38%</td>
<td>16</td>
<td>Texting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.37</td>
<td></td>
</tr>
<tr>
<td>Cell phone</td>
<td>58%</td>
<td>18</td>
<td>Visit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.72</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>23%</td>
<td>10</td>
<td>House/ child sit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td>10%</td>
<td>5</td>
<td>Drive/ school events</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Skype/webcam</td>
<td>11%</td>
<td>4</td>
<td>Day trips</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Chatroom</td>
<td>3%</td>
<td>0</td>
<td>Vacations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Twitter</td>
<td>6%</td>
<td>2</td>
<td>Vacation Home</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.06</td>
<td></td>
</tr>
</tbody>
</table>

The opportunity to add other methods resulted in one respondent offering that her form of communication is a “loud voice 😃” (Female, age 70-75).

4.4  Grandparents’ Technological Ownership, Access, Usage, and Skill Levels

Questions eight through 13 deal with grandparents’ ownership, access, usage, and skills levels. Sixty-three percent of survey participants have computers in their homes. Twenty of the 38 participants who responded, have regular access to computers outside the home. Of the remaining 20, four use a library, ten have access through a friend or relative, and six through a senior center. Nineteen or 25% of respondents report possession of a Twitter or Facebook account. Seventy-two participants own a variety of other technological devices as reported in Table 4.2 below. Percentages are based on number of respondents.
Table 4.2  Technological devices owned by grandparents.

<table>
<thead>
<tr>
<th>Device</th>
<th># / % Respondents</th>
<th>Device</th>
<th># / % Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phones</td>
<td>58 81%</td>
<td>DVD players</td>
<td>49 67%</td>
</tr>
<tr>
<td>iPods</td>
<td>8 11%</td>
<td>VCR players</td>
<td>55 75%</td>
</tr>
<tr>
<td>Digital cameras</td>
<td>34 47%</td>
<td>CD players</td>
<td>59 81%</td>
</tr>
<tr>
<td>Digital picture frames</td>
<td>14 19%</td>
<td>Answering machines</td>
<td>59 81%</td>
</tr>
<tr>
<td>iPads</td>
<td>2 3%</td>
<td>Skype/webcams</td>
<td>17 23%</td>
</tr>
<tr>
<td>Remotes</td>
<td>44 60%</td>
<td>Gaming devices</td>
<td>11 15%</td>
</tr>
<tr>
<td>Navigation devices-GPS</td>
<td>14 19%</td>
<td>Other: DVI, DSI</td>
<td>2 3%</td>
</tr>
</tbody>
</table>

Fifty-six participants report various reasons for purchasing or methods of acquiring these devices, including “many with help from son and grandchildren; I take those along to explain use to me” (Female, age 70-75); “fun, exercise (games convenience; enjoy movies; have a great time playing Wii with my grandkids; my husband and I are 2 big kids” (Female, age 66-70); “keep record of grandkids and everyday life” (Female, age 70-75); “to stay connected with modern technology which was useful to my needs” (Female, age 70-75); “to connect with my children and grandchildren” (Female, age 56-60); “to keep in touch with friends and family, also for entertainment for the grandkids” (Female, age <50); “stay in touch with people, pay bills on line, make reservations, etc. etc.” (Male, age 61-65); “keeping up with technology—personal use for pleasure” (Female, age 51-55); and finally, “everyone has them!” (Female, age 56-60).

Following ownership, a Likert determines grandparents’ skill level in using technological devices. Sixty-eight participants offer the following skill levels. Percentages are based on number of participants answering question; average is based on a Likert scale of 1 – 5 with 5 being high.
Table 4.3 Grandparents’ skill levels in using various technological devices.

<table>
<thead>
<tr>
<th>Overall Response</th>
<th>Likert Results</th>
<th>Overall Response</th>
<th>Likert Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>% Respondents</td>
<td># Respondents</td>
<td>Average</td>
</tr>
<tr>
<td>Cell phone</td>
<td>86%</td>
<td>46</td>
<td>3.75</td>
</tr>
<tr>
<td>iPod</td>
<td>16%</td>
<td>10</td>
<td>2.7</td>
</tr>
<tr>
<td>Digital camera</td>
<td>51%</td>
<td>29</td>
<td>3.6</td>
</tr>
<tr>
<td>Digital picture</td>
<td>26%</td>
<td>14</td>
<td>2.6</td>
</tr>
<tr>
<td>frame</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>54%</td>
<td>32</td>
<td>3.5</td>
</tr>
<tr>
<td>iPad</td>
<td>7%</td>
<td>5</td>
<td>1.8</td>
</tr>
<tr>
<td>Remote controls</td>
<td>71%</td>
<td>40</td>
<td>4.4</td>
</tr>
<tr>
<td>Navigation</td>
<td>30%</td>
<td>17</td>
<td>3.3</td>
</tr>
<tr>
<td>device – GPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVD player</td>
<td>81%</td>
<td>46</td>
<td>4</td>
</tr>
<tr>
<td>Other: shop,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exercise bike</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.5 Technological Learning Methods and Information Exchange

A Likert scale is used to determine methods grandparents employ to learn various technological devices or applications. Sixty-eight participants rank six methods, and as in previous questions, not all use the scale. Percentile is based on total number of respondents to the question; average is based on a scale of 1 to 5 with 5 being high.

Table 4.4 Ways in which grandparents learn to use technological devices or applications.

<table>
<thead>
<tr>
<th>Method</th>
<th>Overall Response</th>
<th>Likert Scale Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># / % Respondents</td>
<td># Respondents</td>
</tr>
<tr>
<td>Self-taught</td>
<td>49</td>
<td>72%</td>
</tr>
<tr>
<td>Work-trained</td>
<td>15</td>
<td>22%</td>
</tr>
<tr>
<td>Senior Center class</td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Other adults</td>
<td>31</td>
<td>46%</td>
</tr>
<tr>
<td>Help from grandchildren</td>
<td>38</td>
<td>56%</td>
</tr>
<tr>
<td>Never learned</td>
<td>2</td>
<td>3%</td>
</tr>
</tbody>
</table>
Next, forty-six grandparents weigh in on devices or applications their grandchildren helped them to learn to use or play. Percentile is based on total number of respondents to the question.

Table 4.5  Number of grandparents reporting on devices or applications that grandchildren helped them to learn to use or play.

<table>
<thead>
<tr>
<th>Device</th>
<th># / % Respondents</th>
<th>Device</th>
<th># / % Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phones</td>
<td>29 38%</td>
<td>VCR players</td>
<td>12 16%</td>
</tr>
<tr>
<td>iPods</td>
<td>3 4%</td>
<td>CD players</td>
<td>13 17%</td>
</tr>
<tr>
<td>Digital cameras</td>
<td>10 13%</td>
<td>Answering machine</td>
<td>7 9%</td>
</tr>
<tr>
<td>Digital picture frames</td>
<td>6 8%</td>
<td>Skype/webcams</td>
<td>3 4%</td>
</tr>
<tr>
<td>iPads</td>
<td>0 0%</td>
<td>Gaming devices</td>
<td>10 13%</td>
</tr>
<tr>
<td>Remotes controls</td>
<td>13 17%</td>
<td>Facebook</td>
<td>7 9%</td>
</tr>
<tr>
<td>Navigation devices-GPS</td>
<td>3 4%</td>
<td>Twitter</td>
<td>0 0%</td>
</tr>
<tr>
<td>DVD players</td>
<td>15 20%</td>
<td>Texting</td>
<td>8 11%</td>
</tr>
<tr>
<td>VCR players</td>
<td>12 16%</td>
<td>Other: TIVO DSI</td>
<td>2 4%</td>
</tr>
</tbody>
</table>

4.6 Satisfaction Levels

Questions 16, 17 and 18 deal with interest and satisfaction levels. Question 16 queries whether the learning or playing was at the request of the grandparent or the grandchild. Thirty-three grandparents respond that the learning or playing was at his/her request, nine grandparents report that the activity was at their grandchild(ren’s) request, and six state that both they and their grandchildren showed interest. When asked, “How much or how well did you learn?”, 57 grandparents respond that 75% learned all they wanted to know, 18% learned everything that his/her grandchild(ren) tried to teach them, 47% learned what they considered to be an average amount, 4% learned very little, and no grandparents reported having learned nothing at all.
A Likert scale measures grandparents’ enjoyment and grandchildren’s perceived enjoyment of the learning or playing experience. Fifty grandparents respond to this two-part question with number ratings, yes or no answers, and comments on their, and/or their grandchildren’s levels of enjoyment. Forty-eight grandparents enjoyed the time spent; of those, 31 ranked their enjoyment at a level of 4.8 out of 5. Grandparents perceive their grandchildren’s enjoyment level to be only slightly less than their own. Forty-two grandparents state that their grandchildren enjoyed the time spent, and of those, 38 ranked their grandchildren’s level of enjoyment at 4.7 out of 5. One grandparent responds that she does not like computers and therefore did not enjoy the time spent.

Thirty-three of the 48 respondents offered additional explanations, both positive and somewhat negative, to the learning/playing interaction and experience, including the following: “Mainly the humor; they laugh at me a lot! But it is really funny! They are very patient” (Female, age 70-75); “We talked of other things and laughed a lot” (Female, age 81-85); “Just being able to spend a little time together” (Gender, age not identified); “We both learned from the other (Male, age 81-85); because we laughed, talked, had snacks, talked and laughed some more” (Female, age 66-70); “one on one time” (Male, age 66-70); “they love knowing more than I do and teaching me” (Female, age 70-75); “I am slower at learning than what my children expect” (Female, age 56-60); It comes so naturally to them, I think they are a little frustrated at my not catching on quickly” (Female, age 61-65); “chance of time together and [chance to] understand their knowledge” (Female, age 85>); “Because it was something we both enjoyed and they like to beat Grandma” (Female, age 61-65). A number of additional comments mirrored those listed above.
4.7 Reciprocal Instruction

Question 19 asks grandparents if they ever taught their grandchildren how to use any technological devices or applications. The percentages in this category are understandably lower. Twenty-eight respondents or 37% percent of participants respond as follows: computer—9, remote controls and VCR player—6, DVD player—5, cell phone and CD player—4, digital camera and answering machine—3, GPS, Webcam/Skype, and texting—2, and iPad, gaming devices, Facebook, and Twitter—1 each. One respondent commented that her grandchildren know more at two years of age than she does now (female, age 70-75), while another added that she taught her grandchildren to play card and board games that do not require electricity (female, age 70-75).

4.8 Interest and Willingness

Questions 20, 21 and 22 deal with grandparents’ interest and willingness to interact with grandchildren on a technological level, or to acquire technological devices at their grandchildren’s request. Each question allows for detailed explanations. Sixty-six or 87% of the participants responded to Question 20 which asks, “If your grandchild wanted to show you things that he/she learned on a computer or device, would you be interested in watching or knowing?” Ninety-four percent of the 66 participants who responded answered “yes;” and 30 of the 33 comments accompanying this question were positive. For example, Female, age 66-70 states, “Yes, because I have the best time watching them explain--especially the excitement in their eyes explaining what they are doing.” Male age 61-65 states, “Yes, to see where she would be going next and how fast she adapts.” Female age 81-85 asserts “yes; they always have such good ideas and know
me well enough to know what I would like.” Female age 85> reports, “Very much; because that encourages that child to learn and he or she knows I care.” Female age 66-70 replies, “Yes; they know how, and are proud of it.” Female age 76-80 answers, “Yes; do it all the time. Want to encourage them to get education.” Female age 61-65 states, “yes, I enjoy any communication with them.” Female age 85> replies, “Yes, I am always willing to learn,” and Female age 56-60 says, “Yes, may show me something new and joy to watch them learn.” Female age 76-80 cites too much violence in the games as a reason for answering “no.”

Question 21 asks, “If your grandchild wanted you to play games or use other technological devices together, would you be interested or willing?” Ninety percent of the 69 participants who responded answered “yes”, and of those, 25 offered positive comments. Respondents’ reasons include, “Yes, they love to win and laugh at me,” (Gender, age not reported); “Yes, I’m not quite too old to learn” (Male, age 81-85). Female age 66-70 states, “Yes, have done it! Especially Mario Kast—it’s a blast and a half.” Female age 81-85 replies, “Yes; I have played games on technological devices with great-grandchild. He always beats me.” From Male age 70-75, “Yes, why not show interest”, and Female age 66-70 says, “Yes, when they set aside time for me to learn their games.” Conversely, Female age 66-70 states, “no; hand to eye coordination is too difficult.” Female, 76-80 offered that she would also be “willing to teach them to play cards and poker”, while Female, 70-75 mentions “poker, euchre, rummy, chess; many other games that don’t require electricity”.

Lastly, question 22 queries, “If your grandchild asked you to buy a technological device so that you could use it together, would you be interested or willing?” Sixty-six
participants responded with 31 answering “yes”, 32 answering “no”, and three undecided. Of the responding participants, nine offered positive comments and 18 offered reasons why they would not be willing to purchase technological devices. High cost and lack of spendable income along with parental responsibility are the leading reasons for grandparents’ unwillingness to purchase technological devices on grandchildren’s behalf. Concerns about violence in the games arose, as well as dependency on what device the child was requesting. Female, age 85> responded positively saying, “Yes, for birthdays or Christmas; I encourage anything or everything to further education”; while Female, age 56-60 states, “Yes, would be something to share and learn together.”

4.9 Grandchildren’s Technological Ownership and Usage

Questions 23 and 24 center on grandchildren’s ownership, access, and usage levels of technological devices. Table 4.6 represents the number and corresponding percentile of grandparents who report technological devices owned by their grandchildren. For example, 64 or 84% of respondents believe their grandchildren own or have access to a cell phone.

<table>
<thead>
<tr>
<th>Device</th>
<th># / % Respondents</th>
<th>Device</th>
<th># / % Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phones</td>
<td>64 / 84%</td>
<td>DVD players</td>
<td>52 / 68%</td>
</tr>
<tr>
<td>iPods</td>
<td>45 / 45%</td>
<td>VCR players</td>
<td>48 / 63%</td>
</tr>
<tr>
<td>Digital cameras</td>
<td>40 / 53%</td>
<td>CD players</td>
<td>43 / 57%</td>
</tr>
<tr>
<td>Digital picture frames</td>
<td>21 / 28%</td>
<td>Answering machines</td>
<td>32 / 42%</td>
</tr>
<tr>
<td>Computers</td>
<td>56 / 74%</td>
<td>Skype/webcams</td>
<td>13 / 17%</td>
</tr>
<tr>
<td>iPad</td>
<td>20 / 26%</td>
<td>Gaming devices</td>
<td>42 / 55%</td>
</tr>
<tr>
<td>Remotes</td>
<td>46 / 61%</td>
<td>Facebook</td>
<td>32 / 42%</td>
</tr>
<tr>
<td>Navigation devices-GPS</td>
<td>27 / 36%</td>
<td>Twitter</td>
<td>14 / 18%</td>
</tr>
<tr>
<td>Texting</td>
<td>28 / 37%</td>
<td>Other: TIVO</td>
<td>1 / 1%</td>
</tr>
</tbody>
</table>
Question 24 asks Grandparents to rank how much time their grandchildren spend on technological devices based on the following Likert scale:

5 = Extreme: more than 5 hours per day
4 = Above average: 4 hours per day
3 = Average: 2 hours per day
2 = Below average: 1 hour a day,
1 = Hardly at all: less than 1 hour per day.

Forty-five grandparents or 59% of participants responded. Table 4.7 represents overall respondents to each device and number of respondents ranking amount of time grandchildren spend on the respective device. For example, 24 grandparents report that their grandchildren spend time on cell phones. Of those 24, 20 respondents report their grandchildren spend a combined average of slightly over two hours per day.

<table>
<thead>
<tr>
<th>Device</th>
<th># Respondents</th>
<th>Overall Response</th>
<th>Likert Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phone</td>
<td>24</td>
<td>VCR</td>
<td>8</td>
</tr>
<tr>
<td>iPod</td>
<td>8</td>
<td>CD player</td>
<td>10</td>
</tr>
<tr>
<td>Digital camera</td>
<td>11</td>
<td>Answering machine</td>
<td>6</td>
</tr>
<tr>
<td>Digital picture frame</td>
<td>5</td>
<td>Webcam/Skype</td>
<td>6</td>
</tr>
<tr>
<td>Computer</td>
<td>24</td>
<td>Gaming Devices</td>
<td>14</td>
</tr>
<tr>
<td>iPad</td>
<td>7</td>
<td>Facebook</td>
<td>11</td>
</tr>
<tr>
<td>Remote controls</td>
<td>2</td>
<td>Twitter</td>
<td>2</td>
</tr>
<tr>
<td>Navigation – GPS</td>
<td>4</td>
<td>Texting</td>
<td>15</td>
</tr>
<tr>
<td>DVD player</td>
<td>13</td>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>

4.10 Relationship Enhancement
Question 25 summarizes the questionnaire asking, “Do you feel that technology has enhanced your relationship with your grandchildren?” Sixty-three of the 76 respondents replied; thirty-nine positively, 18 negatively, and six were undecided or noncommittal in their responses. Female age 70-75 responds, “No, took away talking and relationship,” while Female age 70-75 remarks “Yes; any attention for us is so valuable. I feel the time we spend together is precious,” and Female age 80-85 notes “Yes, some are all over the world and it is hard to try to have time with them.” Male age 70-75 states, Yes, a closer relationship and just fun.” Female age 66-70 observes “Yes, to a point—since the time each one was back I have always had a relationship with them—we learned together.” Female age 70-75 says “No, they like to play games and cell phone,” while Female age 70-75 states “Yes, able to call and share pictures and video. Females age 81 – 85 observe, “No, because I see them a lot,” and “No, I don’t play what they do,” while Female age 70-75 says “Yes, somewhat, because it is a good way to communicate.” Male age 66-70 points out, “Yes, have like interests,” while Male 70-75 notes, “No, spend zero time with grandchildren on technology”. Female age 70-75 comments, “Yes, my grandchildren are still encouraged to be very physically active”, and Female age 61-65 says, “Yes, they are better communicators with us because of it.” Female age 76-80 states “No; make sure they have it—need to use—but don’t make your life around it.” Female age 85> states, “Yes, they don’t answer the phone but will text!” Female age 76-80 answers, “My relationship is great with or with [technology]”. Female age 66-75 and Female age 61-65 respectively reply, “No, they are more involved playing X-Box”, and “No, all she does is play games and text all day.” Female age 70-75 says “Yes, I can talk to them on Facebook,” while Female age 66-70 concurs, “Yes, we do
some social networking together”. Female age 85> replies, “Yes, we use it together,” while Female age 76-80 states, “No, it’s a world I don’t know much about”; Female age 56-60 states, “No, it comes down to the basic need for love for each other” and Female age 81-85 says, “Yes, closer relationship.”

Finally, the questionnaire asks grandparents for any additional thoughts or concerns they may have about grandchildren and technology or the effect of technology on their relationship with their grandchildren. Female age 70-75 states “Need to talk more to people and us”, while Female age 61-65 says “Our grandchildren know more than we do about everything and if we needed help with anything I’m sure they would help us.” Female age 66-70 states “Some children don’t know the fun of playing games outside—this is sad, as all children need to be interacting face-to-face with their friends. I am grateful our grandchildren are well rounded due to their parents interacting with them from an early age”, and from Female age 61-65, “Sometimes they spend too much time on computers and etc and not enough outdoor exercises.” Male age 66-70 replies, “The world is becoming more technological. They will need this knowledge to succeed in the future”, and Male age 61-65 appears to concur stating, “Being able to learn anything whenever or wherever you are is what will help people succeed. On-line school may even be in demand, so operate devices!” Female age 70-75 says, “As they get older, I will have to learn more because I like staying in touch”, and Female age 56-60 says, “My grandchildren would prefer to play computer games, but I make them play board games when we get together. I want personal interaction”, while Female age 61-65 adds, “I think it’s taken away from the face-to-face and in-person visits.” Female age 85> states, “I need to understand their world but have hard [time] keeping up!”
Chapter 5

Discussion

Sherman et al. (2000) state that technology must be made relevant to its users in order for it be valued as an important resource and communication medium, and incorporated into daily activities (cited in Jones, Johnson-Yale and Millermaier, (2009). Ling (2008) discusses the elderly and “older” elderly in terms of intergenerational communication via texting, but his findings can apply to any technological device. Ling summarizes that “the elderly are generally ‘out of the loop’ when it comes to texting and other new technologies” (2008, p. 334), and discusses “a type of tension in the adoption and use” that may inhibit or exclude the elderly from adopting new technologies including design, learning opportunities, life phase, and age segregation (Ling, 2008, p. 334).

While reflecting on the notions set forth above, the discussion will compare study results with contemporary literature.

5.1 Social Statistics

As some respondents are less than 51 years and others greater than 85 years of age, the age span of survey participants is more than 34 years. This span—a full generation—is critical when considering respondents’ answers, views and attitudes
toward technology. As Ling points out, for the younger elderly, computerization, for example, “was well established during their working life. There is a fluency with the technology and its functioning that seems to have facilitated its adoption” (2008, p. 339). The mere fact that 23 seniors age 81 and older chose to participate signals that the elderly and specifically the “older” elderly are definitely interested in technology and intergenerational communication.

Social settings, ease and proximity must be considered when investigating how and why grandparents choose to invest time, energy and money in technological devices. Nearly 50% of the grandchildren counted in this study live within grandparents’ driving distance and 92% of participants share face-to-face communication methods, thus allowing greater opportunities to interact and/or learn technological processes, but also perhaps accounting for diminished technological communication. As Quadrello (2005) notes in the accumulation vs. compensation model described in Section 2.4, grandparents who see their grandchildren more often communicate by landline or cell phone. Survey results show this to be true as respondents weigh in at an average of 4.04 for in person contact followed by landline—27 respondents, and cell phone—41 respondents, averaging 3.37 and 3.72 respectively. Interestingly, cell phone usage outranks landlines, and texting is gaining popularity with 12 grandparents using this medium ranking it at 3.6. The number of grandparents using conventional mail (19) outrank email users (16) only slightly, however email is used more with ratings of 2.1 vs. 2.7 respectively. These results point to grandparents’ willingness to embrace new technologies in order to maintain intergenerational communication.
5.2 Ownership and Access

Reason stands that ownership and/or access to technology is necessary to generate technological communication. Respondents’ technological device ownership levels fall well in line, in fact exceed, the national standard. A Pew Internet & American Life Project report entitled *Americans and their Gadgets* (Smith, 2010), reports that among adults over 65, 58% own cell phones, 45% computers, and 6% game consoles. Another report from this project entitled *Older Adults and Social Media* (Madden, 2010) reveals that 72% of these access the internet daily citing bridging the generation gap as one of three main reasons.

In the present study, 74% of respondents are over the age of 65; 81% of respondents own cell phones, 63% computers, 48% digital cameras, and 15% electronic gaming devices. Respondents likewise voice the need to connect with children and grandchildren, keep up with technology, and simply liking and wanting toys. Stating that adults, grandparents especially, see computer ownership as “cultural capital” (Selwyn, 2004, Exploring the role, p. 60), reinforces respondents’ motivations and viewpoints. A grandfather states, “The world is becoming more technological. [Grandchildren] will need this knowledge to succeed in the future” (Male, age 66-70), while a grandmother, exclaims, “everyone has them!” (Female, age 51-55).

5.3 Learning, Interest, Interaction and Satisfaction

While grandparents’ social information along with ownership and access lend significant structure to the findings of this study, the crux of this research lies in grandparents’ and grandchildren’s satisfaction, mutual interest, and interaction while using technological devices.
5.3.1 Learning Methods

According to Rogers, (2009), “The stereotype is often true: Boomers do learn about technology from their children”, but once they learn, they share with colleagues. Moreover, they reject “the notion that they [are] somehow inherently less capable of learning technology than their children” (pp. 5-6).

Exploring whether children in the household can influence older adults’ learning, Mori and Harada (2010) point out that while instruction manuals and training courses may be the standard learning medium for innovative artifacts, questions arise as to how much knowledge is actually gained using these methods and whether other approaches, especially in the case of older adults, may be as, or more effective. In a study of mobile phone usage, Mori and Harada (2010) found that participants who lived with grandchildren used more advanced functions than participants in a spousal-only group, suggesting greater opportunities as the cause. Analyzing gender and age differences, Chu’s (2010) pioneering research examined family support and internet self-efficacy in the middle aged (56-64) and older adults’ (65+) perceived outcomes of e-learning. Chu’s (2010) findings indicate that in the case of older adults, “family support plays a main role in predicting the effects of e-learning, mediated by general and communication Internet self-efficacy” (p. 263).

Of the 62 participants who reported on learning sources, self-taught at 64% of respondents with a rating of 4.6 out of 5, is the predominant method. Grandchildren as a source or aid was the second highest method with 39 or 51% of respondents rating 3.7 out of 5. Thirty respondents reporting getting help from other adults with a rating only slightly higher than grandchildren as a source at 3.8 out of 5. Only 16 respondents
reported being trained at work, but these 16 noted this method as their predominant source at 4.2 out of 5. The fact that the majority of respondents (63%) are age 70 and older and quite possibly have left the workplace before the onset of technology equates to self-reliance and grandchildren as sources of learning technology. Interestingly, only six grandparents report receiving instruction at senior centers, and these six rate this source at merely 2.8 out of 5. While an Internet search reveals that computer training classes and help desks are available to seniors at multiple locations throughout the survey-related area, the results show that grandparents outside the workplace arena prefer self-taught and help from grandchildren rather than turning to outside sources. One might speculate that negative aspects such as anxiety over the pace of group learning, along with positive aspects of encouragement, individualized instruction and training for specific devices, and familial interaction may be reasons for these learning preferences.

Respondents report getting the most help with cell phones, followed by computers and primarily at their own rather than their grandchildren’s request. Interestingly, 11% received grandchild assistance in learning to text. It appears reasonable that respondents would be most interested in seeking knowledge of these communication devices and that grandchildren would be a likely source for instruction in texting. In earlier research Selwyn (2004, Exploring the role) determined that while children did not play a significant supporting role in adults’ computer learning, an exception was found in the case of grandparents learning from grandchildren, although usually not sustained. In the present study, 75% of participants responded to the question asking how much or how well they learned from their grandchildren, 39% stating they learned all they wanted to know and 47% learned an average amount. Moreover, and perhaps more significantly,
only two respondents reported learning very little, and none reported learning nothing at all. These findings indicate that while not the sole source of instruction, grandparents’ learning experiences are nonetheless encouraged and enhanced by grandchildren’s instruction. Considering many of the respondents’ comments in the present study reflecting the enjoyment received learning from and interacting with grandchildren on a technological level, one might speculate that Selwyn’s (2004, Exploring the role) “usually not sustained” learning caveat may be a simple ploy on the part of grandparents to re-engage their grandchildren in the learning/teaching interaction process.

5.3.2 Enjoyment and Satisfaction Levels

Researching outcomes of older adult learning, Cody et al. (1996) state that successful mastery of new technology should be assessed on the basis of whether individuals enjoy the experience, become absorbed in it, and believe they have gained control and engaged in a challenging experience” (p. 271). Of particular note is respondents’ high enjoyment level with the learning experience. Participants who responded ranked their enjoyment level at 4.8 out of 5. Moreover, they perceived their grandchildren’s enjoyment to be nearly as much as evidenced by a rating of 4.7 out of 5, and comments such as “they love knowing more than I do and teaching me” (Female age 70-75), and “[b]ecause it was something we both enjoyed and they like to beat Grandma” (Female, age 61-65). In this regard, Aarsand (2007) notes the significance of grandparents positioning themselves as novice learners thus gaining satisfaction while validating grandchildren’s position as instructors. This mutually high satisfaction as perceived by the participants not only verifies respondents’ eagerness to learn while cultivating children’s communication skills, but might also serve to modify and mollify
the image of children as techno experts who exploit digital media in order to dominate family interaction, (Mesch, 2006) to one of facilitator and mentor. Selwyn (2004, Exploring the role) reiterates this sentiment stating, “…there is a need for academics to reassess their understanding of children and ICT [Information Communication Technologies] and challenge the authenticity of contemporary discourses about children’s ‘omnipotent’ use of ICT” (p. 68). This fresh perceptual image alone may serve to not only foster older adults’ interaction and willingness to approach new technologies, but further intergenerational communication through technology as well.

5.3.3 Interest and Interaction

Selwyn (2004, Exploring the role) notes that in some cases, divergent skill levels leave grandparents at a disadvantage. Shared time can deteriorate to “little more than an occasional and passive observation of the child’s computer use” (p. 63). Contrary to this observation, 87% of participants responded overwhelmingly—94% that they would be interested in watching or knowing what their grandchildren learned on technological devices. That 30 of the 33 accompanying comments were positive affirms their interest. For example, Female, age 66-70 states, “Yes, because I have the best time watching them explain--especially the excitement in their eyes explaining what they are doing”, while Female age 85+ says “Very much; because that encourages that child to learn and he or she knows I care.” Building on their interest, 61 of the 69 respondents replied and commented positively (90%) when asked if they would be interested in playing or using technological devices with their grandchildren. Again, 25 positive comments validate their answers, and include the following, “Yes, they love to win and laugh at me,” (Gender, age not reported); “Yes, I’m not quite too old to learn” (Male, age 81-85); “Yes,
have done it! Especially *Mario Kast*—it’s a blast and a half* (Female, age 66-70); “Yes; I have played games on technological devices with great-grandchild. He always beats me” (Female, age 81-85); and “Yes, when they set aside time for me to learn their games” (Female, age 66-70). While these positive attitudes reveal grandparents’ sincere interest and desire to interact and learn from and with their grandchildren, indifferent responses bear observation. One respondent cited problems with hand-eye coordination, while another voiced concern over the level of violence in games.

5.4 **Willingness to Purchase**

Finally, 87% of participants responded to the question, “If your grandchild asked you to buy a technological device so that you could use it together, would you be interested or willing?” Rather than overwhelming positive responses, grandparents appeared somewhat reserved; 31 responded they would be willing, however, 32 said they would not be willing to purchase devices. Rogers (2009) cites confusing and lengthy instruction manuals, and concerns with security and privacy as technological issues experienced by the elderly. Rogers (2009) goes on to describe the elderly as “sensible adopters, who aren’t about to change the way they live to fit technology. … Yet when presented with leading-edge technology that directly addresses their needs – even products not yet widely available – boomers are enthusiastic” (p. 8). Thus, one might question whether greater familiarity with the medium and related devices combined with knowledge of how the devices might enhance intergenerational relationships, and awareness of other grandparents’ positive experiences would alter their responses.

5.5 **Positive Viewpoints/Conflicting Concerns**
Although this study confirms grandparents’ desires and interests in learning, knowing, and interacting with their grandchildren via technology, grandparents nonetheless express misgivings about technology in their grandchildren’s lives. Fifty-nine percent of participants responded regarding the amount of time they believe their grandchildren spend on technological devices. The researcher notes that many respondents verbally indicated vagueness as to a specific amount of time their grandchildren actually spent on various devices. However, while grandparents report only average usage of devices overall—3.1 on a Likert scale of 1 – 5, their comments indicate conflicting viewpoints as to relationship enhancement. Respondents’ comments range from the extreme negative, “No, took away talking and relationship” (Female, 70-75), to the extreme positive, as Female, 61-65 reports, “Yes, they are better communicators with us because of it.” According to a Center for the Digital Future Project Report – Year Nine entitled Family Time Decreasing with Internet Use, “More and more of America’s Internet-connected households report erosion of face-to-face family time … and growing concerns that children are spending too much time online” (USC Annenberg, Family Time Decreasing, p. 1). In a 2010 update, this study goes on to report that among families with Internet access, face-to-face interaction has declined from “8% in 2000 to 34% in 2009” (USC Annenberg, Web Insight 72). While this condition may certainly exist, it need not prevail. A 2010 Pew Research Center Report entitled Older Adults and Social Media states, “There are few other spaces … where tweens, teens, sandwich generation members, grandparents … regularly intersect and communicate across the same network. [t]hese social spaces pool together users from very different parts of people’s lives and provide the opportunity to share skills across
generational divides.” (Madden, 2010, p. 7). Discussing the merits of communication technology, Rogers (2009) cites elders’ positive and negative viewpoints. Noting a growing disregard for social manners, elders find aspects of texting more polite than cell phone usage. Rogers (2009) comments on seniors’ opinions, stating, “Perhaps the biggest communication conundrum … is that technology has the potential to create new barriers between people as well as new connections” (p. 12). While technology might be viewed by some as creating isolation, it also provides choices for those who wish to occasionally opt out of social interaction. According to a participant in Rogers’ study, “You have more choices that are more comfortable for people versus stepping outside the door, outside their comfort zone, and confronting humans” (Rogers, 2009, p. 12).

Rogers’ study also revealed that elders do not necessarily blame technology for declining social standards, rather they commend it. “…if anything the technology should strengthen communication. It’s a social priority, more than technology” (Rogers, 2009, p. 14).

5.6 “Older” Elderly

Reiterating the Initial Rationale in which the researcher anticipated garnering opinions and attitudes toward technology from an older population, the results of survey participants aged 81 and older are addressed in this section as they are presumed to have less workplace exposure to technology. Categorizing seniors, Zickuhr (2011) identifies the “Silent Generation” and the “G.I. Generation”, ages 66 through 75+ as those who may have left the work environment before the arrival of technology for every-day use. As mentioned earlier, Ling (2008) refers to the point in people’s lives in which technology became important. Forty-eight participants are age 70 and older, and perhaps retired or near retirement. Of these, 23 are over 81 years of age and may have been
retired for up to a decade from their major career positions. Only two participants are
below age 55, and the remaining are age 56 through 69. Because of economic conditions
and increased longevity, the researcher anticipates that participants up to 70 years of age
may have recently retired or may still be in the mainstream of employment and as such
may have a greater exposure to technology. Reflecting on Ling’s commentary, the
importance and perhaps even necessity, perceived or otherwise, of technology may vary
greatly in the lives of survey participants. Investigating the results of the more senior
population of this survey—those aged 70 and older and comprising 63% of participants,
25 report help from grandchildren in learning various technological devices, 26 reported
being self-taught, and 20 report learning from other adults. Only six grandparents report
learning from work, and five report instruction at senior centers.

Although comments are not sought when asking how much or how well learned,
some reasonable conclusions may be drawn from responses of the 70 and older
population. Fifteen reported learning all they wanted to know, six reported learning
everything the grandchild tried to teach, and 18 reported learning an average amount;
conversely, only one reported learning very little and none reported learning nothing.
These responses point to an active rather than passive desire to participate in
technological learning and skills acquisition and intergenerational communication
relative to technology as well. Further, 26 of the 70 and older age group responded that
they enjoyed the time spent; 24 of the 70 and older age group believe their grandchildren
enjoyed the time spent as well, with ratings of 4.7 out of 5 to both questions. Only one
respondent answered that she did not enjoy the time spent and did not like computers
(Female 76-80). Perhaps, however, the comments of the “older elderly” as to why they

enjoyed the time spent are most revealing. “We talked of other things and laughed a lot” (Female, 81-85), “We both learned from the other” (Male, 81-85), “Chance of time together and understand their knowledge” (Female, 81>). “Mainly the humor; they laugh at me a lot! But it is really funny. They are very patient” (Female, 70-75). “They love knowing more than I do and teaching me.” (Female, 70-75). Other comments reveal simple enjoyment of their time together, and deep love for their grandchildren.

The comments of the 75 and older age groups to questions regarding their interest in watching or knowing what grandchild knows, or interest in using or playing with devices together, and a willingness to purchase devices are equally revealing. Participants took this opportunity not only to voice pride in their grandchildren’s technological expertise, but also to inform their desire for continued learning and involvement. Female, 81-85 replies, "Yes, they always have such good ideas and know me well enough to know what I would like;” Male, 81-85 reports “Yes, I’m not quite too old to learn”; Female, 85> states “Yes, to be together”; Female, 81-85 responds “Yes, I have played games on technological devices with great-grandchild. He always beats me”. Male 70-75 states, “Yes, for 8 and 12 years old they are well educated and show interest”, and Female 76-80 says, “Yes, I’m always happy to see what they bring”. Female, 70-75 states, “Yes, I’m interested in everything they do”, while Female, 85> comments, “Yes, I am always willing to learn”. Female 85> answers, “Very much, because that encourages that child to learn and he or she knows I care” and further states, “Yes, for birthdays or Christmas; I encourage anything or everything to further education.”
When asked if technology has enhanced their relationship with their grandchildren, respondents from the 70 and older age groups voiced mixed emotions. “Yes, some are all over the world and it is hard to try to have time with them” (Female, 81-85), while Male, 81-85 states, “No, the Lord always made us best friends without electronics.” Positive responses come from three Females 85>, “Yes, gives a reason to get together and communicate”, “Yes, they don’t answer phone but will text!”, and “Yes, we use it together”, and from Female, 81-85, “Yes, closer relationship”. These comments are countered by “No, I don’t play what they do”, (Female 81-85), and “No, don’t use it that way”, (Female, 85>), and “No, took away talking and relationship” (Female, 70-75). Male age 70-75 responds, “Yes, a closer relationship and just FUN”, while Female, 70-75 states, “Yes, able to call and share pictures and videos.” Female, 81-85 says, “No, because I see them a lot”, while Female 70-75 concludes, Yes, somewhat, because it is a good way to communicate.”

5.7 Gender Analysis

Lanigan cites Venkatesh et al. 2003 who established that “women were less likely to use aspects of technology that were perceived to require extensive effort to master.” (Venkatesh et al. 2003, qtd. In Lanigan, 2009, p. 600). The results of this study as noted in findings and comments clearly dispel that notion. Seventy-eight percent of participants in this survey are female while the majority of comments supporting adoption, knowledge acquisition, willingness to learn, and satisfaction are supplied by women. Venkatesh et al. goes on to state that “This effect was further moderated by age; a positive correlation was found between age and reluctance to exert effort to learn new technologies” (Venkatesh et al. 2003, qtd. In Lanigan, 2009, p. 600). Reflecting on
Comments of the most senior population of this survey, those age 85 and older as noted in foregoing sections of this study, age proves no barrier to women’s desires and efforts to stay abreast of new technologies.

5.8 Literature Implications for Additional Research

Conducting a study of factors that affect the frequency of grandparent–grandchild contact, Saito and Yasuda (2009) report that although Japanese households shared by grandparents and grandchildren have declined in recent years, “there is evidence that grandparents and grandchildren desire a higher frequency of intergenerational contact (FIC) and prefer to spend more time with one another” (p. 118, 119). Factors measured were physical distance citing proximity of living as a main factor in intergenerational contact, along with parental roles, age, gender, and household income and time. Although not a focal point of the study, “possession of communication media” was measured as a control variable, and while parental roles was the determining factor in bridging the generations, “it was interesting that parents’ availabilities were, indeed, more important than the characteristics associated with children, such as child’s time and use of electronic communication devices” (Saito and Yasuda, 2009, p. 129). Of particular interest to the present study was a concluding section devoted to “Electronic Communication Devices” that states:

We could not find any relevant evidence about the role that electronic communication devices play in influencing the frequency of intergenerational contact in families. There were not enough studies that empirically examined the interaction via electronic devices between the older and younger generations. Mass media sometimes show rare cases in which grandparents had contact with children via electronic communication devices, but these cases are not popularly observed as a statistical tendency (Saito, 2006). Probably, we see only in our future that electronic communication devices could indeed reduce a physical gap.
between grandparents and children who live across long distances. (Saito and Yasuda, 2009, p. 131)

Survey respondents noted a desire to teach their grandchildren card games and other non-technical activities. Cindrich (2011) describes “old games gone digital” where grandparents “can share their expertise with [their] little technophile” (p. 157). Cindrich delineates many other activities using Skype, YouTube and CD’s. Livingstone (2001) maintains that “Indeed, children and young people … are most motivated to construct identities, to forge new social groupings, and to negotiate alternatives to given cultural meanings; in all of these, the media play a central part (p. 308). Baker (2011), commenting on the growing popularity of Facebook, states,

Over the past few years, Facebook has morphed from a closed site for college students to an online playground where barriers of age, distance, background and technological expertise have been leveled. It has become a rare space where generations can meet on neutral turf to share and interact (no page).

Baker cites Madden who notes significant life changes experienced by recent retirees, young adults and teenagers and states that “this social networking and communicating can be a very powerful force in helping them move forward” (Baker, 2011, no page). Baker calls attention to the unique role grandparents play on Facebook, stating that many children limit or block their parents’ access while granting open access to extended family, thus allowing grandparents to “perform duties of light surveillance” (Baker, 2011, no page). Delineating the role of social networking in seniors’ lives, Rogers (2009) states, “Social networks will serve … [f]irst as a connection to family, as the social network becomes a powerful way to remain a part of their children’s lives without intruding” (p. 23). Reviewing technology in general, Rogers’ (2009) study reveals that Boomers would
agree with the statement, “Technology will help me live a fuller life” (p. 24) and view future technology “with great enthusiasm and just a touch of caution” (p.25).
Chapter 6

Conclusion and Future Research

Research Question R1 asks, “How does technology aid in strengthening or weakening the grandparent-grandchild relationship?” Data, respondents’ commentary and the literature reveal that technology aids in strengthening the grandparent-grandchild relationship in a number of ways. Technology opens avenues of communication hampered by familial separation; it allows intergenerational interaction without intrusion; technology provides means for grandparents to acknowledge grandchildren’s expertise, and for grandchildren to share knowledge with grandparents; it facilitates legacy building and cultural transmission. In short, technology is a contemporary intergenerational communication bridge.

Hypothesis R1a, Technology and technological devices can be used to enhance the grandparent-grandchild relationship; and Hypothesis R1b, Grandchildren play a significant role in grandparents’ knowledge acquisition and use of technological devices, are supported.

While some respondents voiced frustration in attempts to learn or interact technologically, grandparents nonetheless expressed a strong desire to learn various technological devices and processes in an effort to maintain communication and
interaction with their grandchildren. Prevailing comments revealed patience and humor on the part of both grandparents and grandchildren, and experiences of reciprocal learning. Data and anecdotal comments clearly reveal that technology and technological devices can be used to enhance the grandparent – grandchild relationship.

Research question R2 asks, Do grandchildren enhance or reduce grandparents’ knowledge and/or use of technology? The data gathered in this study reveals that grandchildren play a moderate to significant role in grandparents’ knowledge acquisition and use of technological devices, especially in the case of the older elderly. While the prevailing method of learning for all respondents is self-taught, help from grandchildren followed closely overall, and nearly tied (26 self-taught, 25 help from grandchildren) in the older elderly age ranges. The fact that only 11 grandparents sought help at senior centers or were work trained reveals their desire to learn perhaps on a one-on-one basis, from a person on whom they can rely to be patient and understanding of their ability levels, and familiar with their technological needs—a role that tech-savvy yet loving grandchildren can clearly and easily play. Moreover, as technology advances and becomes more widespread while at the same time grandparents retire and forfeit a learning resource, grandchildren can fill an even greater instructional role. Data further reveals that grandparents learned an average amount at the least, to all they wanted to know or all their grandchildren tried to teach them. Only two reported learning very little and none reported learning nothing at all. These results indicate a willingness on the part of grandparents to engage in the learning process, a positive effort on the part of grandchildren to effectively instruct their grandparents, and one can assume that both
generations exercised a civilized degree of patience and understanding during the teaching/learning process.

Hypothesis R2a, Grandparents experience high interest and satisfaction levels interacting with grandchildren in the use of technology, is supported. Results show that of those who responded, grandparents who are interested in not only watching and knowing what their grandchildren can do on technological devices, but also wish to actively engage in the technological playing/teaching/learning experience are in the 90th percentile; moreover, that they rate their and their grandchildren’s enjoyment levels at 4.8 and 4.7 out of 5. And, while some grandparents have misgivings about the effects of technology on their grandchildren, their comments nonetheless indicate a willingness to overlook their reservations in order to maintain connectivity on their grandchild’s playing field—that is at the technological level.

Thus, the questions of whether technology aids in strengthening or weakening of the intergenerational relationship and whether grandchildren cause or enhance grandparents’ knowledge or use of technology also speak to the overarching issue of intergenerational communication and concerns regarding the perceived growing gap in the grandparent-grandchild relationship.

A 2010 Kaiser Family Foundation study surveying over 2000 children and teens found that “8 to 18 year olds spend an average of 7 hours and 38 minutes a day using computers, televisions, MP3 players, and other media”; an increase of nearly 1.5 hours since 2004 (Rideout, Foehr & Roberts, 2010, p. 1). Delineating Internet training tools relative to older adult learners, Cody et al. (1996) include “training that involves high participant involvement and hands-on experience, … cooperation between mentor and
tutor … who help one another and explore new technologies together, … and maintenance of rewarding experiences between individuals who work together to learn and use new technologies” (p. 271). This learning experience can naturally apply to the grandparent-grandchild interactive relationship.

Ward and Smith (1997) discuss how technology facilitates older adults’ needs—life review, staying connected, and leaving a legacy. The results of this study indicate that grandchildren play a moderate to significant role in grandparents’ technological learning and that learning communication devices that enhance the grandparent-grandchild relationship take precedence over other technological devices. Rather than viewing this interaction as a mere passive exchange of information, perhaps it may be viewed and further explored for its intergenerational potential—as a meaningful social ground for both generations, as a conduit for intergenerational communication. To that end, further research entailing surveys and interviews of both grandparents and their grandchildren may be beneficial. Initial surveys might be conducted separately and then compared, followed by conversations exploring points of agreement or conflict in grandparent and grandchild responses.

This survey revealed that the elderly benefit from personal technological instruction, and while many senior facilities offer technological instruction, specifically in the use of computers, the elder may shun this opportunity for a number of reasons. Senior facilities might improve technological instruction by inviting grandchildren to conduct tutorial sessions, not only in the usage of computers, but also on a number of other devices as well. While older adults may have basic knowledge of cell phone operation, for example, grandchildren could instruct elders in the various optional
features as well, thus opening greater avenues of collegial and intergenerational communication.

The impact of evolving technology on an aging society is significant. As barriers to information access have diminished, so will advancing technologies decrease barriers created by distance and ability to travel. As noted in the results of this study, the elderly have an interest in advanced technology and grandparents in particular exhibit a keen interest in technologies that allow them to keep abreast of their grandchildren’s activities actively and passively. Social networking sites such as Facebook provide such opportunities and can be accessed and learned in a single instructional session. That survey participants have Facebook and Twitter accounts and use Skype and Webcams while at the same time continue to use VCRs and answering machines attests to their stance to embrace and use technology to fit their needs.

As grandparents allow, invite and encourage grandchildren to share their technological knowledge and expertise, both generations can enjoy a positive experience. Reflecting on Baker (2011, no page cited), the grandparent-grandchild relationship truly can create “a perfect storm of demographics and technology.”
References


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