HHS Public Access

Author manuscript

J Appl Gerontol. Author manuscript; available in PMC 2017 June 30.

Published in final edited form as:

J Appl Gerontol. 2013 August ; 32(5): 540–560. doi:10.1177/0733464811431824.

You Can Teach an Old Dog New Tricks: A Qualitative Analysis of How Residents of Senior Living Communities May Use the Web to Overcome Spatial and Social Barriers*

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Abstract

For adults in senior living communities, information and communication technologies, (ICTs) can be used to increase and expand communication for a population that is often spatially and socially separated from the general public. Using qualitative observational data from a longitudinal study of the impact of ICT usage on the quality of life among residents in assisted and independent living communities, we examine whether ICTs can mitigate the effects of social and spatial barriers. We find that ICTs have the potential to allow individuals to transcend social and spatial barriers, providing residents with the ability to maintain and enhance social networks as well as provide a greater sense of connection to the world at large.

INTRODUCTION

Residents of assisted and independent living communities (AICs) face social and spatial barriers when they enter institutional care (Mitchell & Kemp, 2000). For purposes of this paper, social barriers represent the negative qualitative changes in social interactions and social ties that may occur as a consequence of institutionalized living, while spatial barriers represent the physical changes that can impede connection and engagement of residents of AICs. These barriers can result in a sense of being “left behind,” impacting quality of life (Blaschke, Freddolino, & Mullen, 2009; Wright, 2000). Prior research has failed to examine whether the use of technology can help older adults in AICs overcome these types of barriers. The purpose of this paper is to describe our findings on how social and spatial barriers among residents of AICs may be impacted through the use of information and communication technologies (ICTs) specifically computers and the Internet.

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IRB PROTOCOL: X081021002

BACKGROUND

Assisted/Independent Living and Reduction in Quality of Life

While older adults prefer to age in place (i.e., remain in their homes; Chen et al., 2008), they move into AICs for a variety of reasons, ranging from health to financial and social concerns (Sergeant & Ekerdt, 2008). Assisted living is designed for individuals who require some level of assistance with everyday activities such as meals, medication, bathing, and transportation (ALFA, 2010). Unlike assisted living, independent living is rarely regulated or standardized (Stone & Reinhard, 2007). In some locations independent living may be little more than senior apartment living with common meals and group transportation (Stone & Reinhard, 2007), while in other locations it may offer services like those in assisted living (ALFA, 2010).[1] While there are differences between levels of care and stylistic elements of AICs, most residents are impacted in some part of their life (Park 2009).

The desire to age in place is contravened when seniors move into AICs, as their worlds are significantly changed (Chapin & Dobbs-Kepper, 2001; Park, 2009). Those moving into AICs are likely to experience reduced quality of life. Loss of social connections (social barriers), physical separation from familiar places and routines (spatial barriers), and resulting emotional distress can combine to affect the mental and physical health of residents (Ball et al., 2000).

Social Barriers

The world of senior adults living in AICs is often socially compressed in comparison to their former world (Cannuscio, Clark, & Kawachi, 2003; Chen et al., 2008; Cornwell & Waite, 2009). Decreased contact with social network members outside the AIC, in combination with the social constraints of institutional settings, can impact the quality and quantity of residents' social interactions (Cannuscio et al., 2003). At a minimum, the move into an AIC often means that it becomes difficult to maintain the previous quality and quantity of contact with relatives, long-time friends, and neighbors (Cannuscio et al., 2003).

Although residents of AICs can make new friends, it may take time for the levels of trust and ease with these new friends to rise to levels that would compensate for loss of other social ties (Adams, Sanders, & Auth, 2004). Additionally, poor health and/or cognitive impairment can diminish connection with others (White et al., 1999). This can have profound negative effects on perceived quality of life (Adams et al., 2004). Some residents may even resist investing in new friendships because of awareness of the "limited time" they have left (Carstensen Fung, & Charles, 2003) and primarily devote effort to the maintenance of previous relationships (Park, Zimmerman, Kinslow, Shin, & Roth, 2010) which have more "immediate confirmation" with less effort required (Melenhorst, Rogers, & Caylor, 2001, p. 221). In short, social barriers are the cognitive and social constraints, real or perceived, that may result in reduced social connection and reduced quality of life.

[1]For the remainder of the paper, it can be assumed that both independent and assisted living are addressed concurrently.

Spatial Barriers

Spatial barriers are physical constraints, real or perceived, that increase isolation and reduce quality of life. These include attributes such as physical distance from previous communities, confinement of residents to their AIC, or unwritten spatial "rules" (e.g., cross-visitation between assisted and independent living informally discouraged). The scope of the AIC resident's world often lies within the physical structure of the AIC (Mitchell & Kemp, 2000), with their days characterized by planned group activities. The majority of AIC activities are confined to the AIC due to the difficulties associated with transporting groups of older adults (Knight & Mellor, 2007).

Many AIC residents may find themselves isolated, due to distance or lack of transportation at convenient times, from community or group activities in which they previously participated, leading to decreases in life satisfaction, mastery and an increased sense of loneliness (Ball et al., 2000; Hawes & Phillips, 2000). These kinds of spatial barriers have an effect on quality of life because the resident can no longer be as active a participant in the world outside the AIC (Cannuscio et al., 2003).

Using ICTs to Overcome Social and Spatial Barriers

Both social and spatial barriers combine to limit opportunities for meaningful social connections, impacting both the physical and psychological health of residents (Park, 2009). Studies with older adults have found that ICT usage provides benefits such as increased efficacy in management of their own health (Campbell & Wabby, 2003), increased social support and enhanced cognitive and physical well-being (Blaschke et al., 2009), and increased connections to family and friends, which can decrease feelings of isolation or depression (Davidson & Santorelli, 2008). Specifically, White et al. (2002) note, "As a source of information, social activity, and interpersonal communication, the Internet may expand the constrained boundaries of congregate housing, retirement communities, and even skilled care nursing facilities" (p.220).

ICT usage may help to maintain or enhance existing social networks, offer the potential to extend social networks (Chaffin & Harlow, 2005; Selwyn, 2004; White et al., 1999; Wright, 2000), and maintain family bonds across distances (Climo, 2001). Additionally, Nahm and Resnik (2001) suggest that Internet use, especially email, can be important for older adults as they become less socially active. Thus, ICTs may be able to play an important role in helping older adults in AICs overcome social barriers when designed with features that address age-related changes in older adults (Melenhorst et al., 2001).

ICTs may offer AIC residents the ability to transcend spatial barriers with technology like Google Earth, Google Maps with Street View, and virtual tours of cultural institutions, allowing residents to stay connected to previous residences, places with sentimental value, or to 'visit' places of interest that are no longer accessible for various reasons. Internet usage can help older adults feel as though they are "out of the house" even when physically unable to leave their place of residence (Bradley & Poppen, 2003, p. 20).

This paper examines how ICTs may be used by AIC residents to overcome both social and spatial barriers. It arises from a larger study focused on training AIC residents to use

computers and the Internet and assessing the impact on their quality of life over time. During the course of conducting training sessions and reviewing field notes, observation files, and project updates, the theme of social and spatial barriers became evident. These themes of social and spatial barriers in each AIC, the ways in which residents used ICTs to diminish these barriers, and how that use was related to AIC characteristics warranted further exploration.

METHODS

Overview

The data for this paper were gathered concurrently with the conduct of a multi-site research study involving training older adults in AICs to use ICTs. This paper focuses specifically on qualitative data collected as field documentation of an eight-week ICT training course at AICs in the vicinity of a medium sized metropolitan city within the Deep South region of the United States. Participation was open to all residents of each participating AIC. A shortened version of the Mini-Mental State Examination (MMSE) was used to screen out residents with cognitive impairment who would be unable to complete the intervention portion of the study (Folstein, Folstein, & McHugh, 1975). All volunteers with a score of 18 or higher out of a total score of 25 were accepted to participate in the study. Questions from the SF12 (Ware, Kosinski, & Keller, 1996), and questions on social capital, were also included in the screening instrument for use in the event of a surplus of volunteers to ensure that we accepted volunteers with a broad range of health statuses and social capital. Though the questions on this portion of the screener were asked, it was never employed to include or exclude participants, as there was never a surplus of volunteers.

ICT Intervention

Portable computer labs were set up in each AIC twice per week for training purposes. The technology intervention was 1.5 hours twice a week, with an additional 90 minutes of optional office hours for extra help or questions. On average, 29 hours were spent interacting with these residents during each eight-week training series.

The structured technology training sessions started with the basic lessons including identifying computer parts, turning the computer on and off, and basic computer terms. All instruction was supplemented with a detailed, custom-written training manual. Complexity of training sessions increased to include email, web-searching techniques, social networking sites, multimedia sites such as Hulu and YouTube, and evaluating websites and online information. As the focus of the training was more on using the web to communicate and find information, training on specific non-web computer applications (e.g., MS Word, Photoshop, iTunes) was not included. Each ninety-minute session had one lead instructor and one or more assistants who moved around the training room helping participants and answering questions as needed (see Table 1). Across training sessions, lead instructors remained the same for each topic to ensure consistency of instruction; however the assistants varied depending on project staff availability.

Additional “office hours” included time for questions and practice, as well as time for topics of participant interest not included in formal instruction (e.g., Google Earth, advanced social networking). To accommodate those who did not have their own computer or Internet access or who simply wanted to use more current technology, one desktop computer for every five participants was provided to each AIC and installed in common areas.

Qualitative Data

The data for this paper consist of a series of progress updates, field notes, focus group data, and observation files recorded during the course of the training sessions. After each intervention or office hour session, the lead instructor compiled an informational update for the session which included: what was covered, how the participants responded, difficulties encountered, participant absences and reasons for absence, suggestions for improvement, and any other relevant information. These updates were emailed to all project staff, with those present at the session adding information they deemed relevant before the update was recorded in an update file.

Separately from instructor updates, a staff member trained in qualitative fieldwork attended each session to record detailed field notes. The field researcher noted room characteristics, participant and instructor demeanor and interactions, conversations, class time chatter, participant responses, actions, questions, and any other relevant information. Although it was not always possible, the field researcher was encouraged to stay removed from the participants and class proceedings. Two staff members rotated field researcher duties based on their availability; the time spent by each field researcher within each community was roughly equal.

At the end of each eight-week session focus groups were conducted assessing participants’ perceptions of the impact of different aspects of the training, the instructors, and the equipment and training materials. In addition, “observations” and “lessons learned” files were kept in which project staff recorded observations that were interesting, noteworthy, troubling, surprising or that indicated something that did or did not work well.

Data Analysis

Data analysis followed an inductive approach using a grounded theory qualitative method, with common themes and concepts arising from the observational data. All qualitative data documents were organized chronologically and then systematically reviewed for common themes. As more data were collected and reviewed, the process was repeated until it was felt that a saturation point had been reached. As patterns began to emerge, documents were reviewed again to confirm that evidence for the patterns still appeared and to check for missed examples. From this process, social and spatial barriers in AICs were identified by noting the presence of these concepts, their effects on residents, and ways in which they might already be overcome or ways in which the ICT training helped to overcome them.

RESULTS

Participant Characteristics

Results are reported based on data from three AICs. ICT training was conducted at AIC 1 in late summer 2009, at AIC 2 in fall 2009, and at AIC 3 in winter/spring 2010. A total of 43 residents completed the ICT training in these three communities; 79.1% were female and 90.7% were white (see Table 2). Almost all of the participants (94.9%) indicated that they had either enough or more than enough economic resources to get by.

AICs, Barriers, and ICTs—To some extent, social and spatial barriers existed at each AIC. However, in two of three AICs, either social or spatial barriers predominated. At AIC 3 social barriers seemed to be the dominant concern of the class participants as a whole, while at AIC 1 spatial barriers seemed to be dominant. These differences seemed to arise from community-level characteristics such as physical location, involvement of activity directors and staff, and physical layout of the AIC (see Table 3 for AIC characteristics). In certain instances, individual participant differences seemed to outweigh the community-level characteristics, but this was not a frequent finding. Because of the influence of community-level characteristics, we address the culture at each AIC, illustrate how social and spatial barriers presented themselves at each AIC, discuss how residents deal with these barriers, and describe how ICTs were used to overcome these barriers (see Table 4 for a summation of quantified AIC Barriers and ICT Emphasis). In particularly notable cases of individual differences predominating, we explore those.

AIC 1

AIC 1 was a bright, open facility with a feeling of ongoing activity apparent on nearly every visit. The activities director at AIC 1 was very involved in residents' lives, scheduling many activities and encouraging residents to attend and stay involved. See Table 3 for information about the number of scheduled activities in each AIC. The activities director and the staff seemed very interested in keeping residents busy and engaged. There was much interaction among residents and between residents and staff. The overall sense was of a place and people in constant motion. Physically, AIC 1 was somewhat isolated. Although close to shopping and professional offices, residents would have been required to cross busy roads and navigate somewhat hilly terrain. This left most residents dependent on AIC or family transportation to leave the community.

As one might expect from this description, spatial barriers seemed to be a larger issue than social barriers at AIC 1. While residents were certainly at some level removed from their social networks, the ongoing activities and sense of "family" perpetuated by the staff and activities director seemed, at least for most study participants, to alleviate feelings of social isolation. While a couple of our study participants expressed great interest in renewing old social connections, the emphasis during class seemed to be on overcoming spatial barriers. Several participants, for example, showed keen interest in ICT activities that could link them to other places such as former homes and communities or homes and businesses of social ties. For the most part, the desire for these linkages seemed to center on the physical location, not the social networks associated with them. For example, participants were very

interested in using the Internet to see pictures of previous churches, homes, and hometowns through services like Google Maps with Street View or satellite imagery. This use of computers, "visiting" their previous communities, seemed especially salient at this particular AIC.

As many of the participants from AIC 1 were not originally from the area, overcoming spatial barriers to revive connections to their previous lives was especially exciting. They would often call one of us over to the computer to view what they had found and then tell us something about the history of it. After seeing her former home, one participant exclaimed, "*They cut down my pine trees*!" Another participant was interested in using the Internet to see pictures and read more about his son's business. One participant searched and found her old church and other hometown places. At the end of the session she told us, "*Thank you, I felt like I visited home today*". Participants were unable to physically visit these locations, but through the use of ICTs, they were able to visit them virtually. Although many participants also used email or initially used Facebook, the overwhelming interest was in using ICTs to overcome distance and/or physical limitations.

There was one case, however, of an individual difference outweighing the community-level characteristics. One of the participants had no living family and only one friend whom she could no longer visit in person. Two of the other participants remarked that the computer class was the first activity in which they had ever seen her involved. When the class was asked during one session what they would like to search for, this participant responded, "*A man*!" She was more interested in using Google search and yellowpages.com to find a man from a family she had not seen or talked with in many years. She established a correspondence with him through email. Her sense of success in being able to locate him and establish correspondence with him through email was captured by her remarks, "*I'm a hot, 87 year old computer expert. I know how to Google*!"

AIC 2

AIC 2 exhibited a stark feeling of compressed space and limited activity. Although designed to look and feel like home, it actually felt artificial, at least to the research team. The entrance was code-locked from the outside; thus, visitors had to know the code or wait for someone to unlock the door. This is in contrast to the other locations where entrances were open, but monitored by staff.

There were fewer group activities for residents than we noted at AIC 1 and 3 (see Table 3). The quality of the activities was also different. While activities at AIC 1 seemed designed for engagement (e.g., guest speakers, mixers, etc.), the activities at AIC 2 seemed more designed to pass time (e.g., sing-a-longs with recorded music, television watching, etc.). There was little involvement by the executive director and there was no dedicated activities director. Residents at AIC 2 seemed to avoid the common areas. The only place we saw multiple residents gathered was in a small dining area near the nurse's station, where groups would often sit to watch TV.

During the ICT classes, there was little interaction between participants. Although they seemed to at least know each other, they did not seem to cohere as a group. Participants were

often late or left early. Four participants in AIC 2, however, were transported in from another local community owned by the same corporation and having much the same feel. The lack of engagement and group unity seemed to pre-date our study and seemed to us related to community-level characteristics. AIC 2 was physically isolated. Although not far from shopping and professional offices, getting to those locations would have required traversing substantial hills and traffic, something that seemed unlikely for most of our participants as their health status seemed to contraindicate this type of activity. There was also little parking for family or visitors.

The sense from AIC 2 was that both social and spatial barriers were of significant concern. However, many participants seemed set on using their new skills to maintain or re-establish contact with social network ties (i.e., to overcome social barriers). One participant's move to assisted living had taken him far away from his former church community. He spent much time using email to re-establish and maintain contact with members of his church community. Another participant became similarly re-involved with former social network members, using Facebook and email to connect with people from the town from which she had moved. Not only were participants able to overcome social barriers by reconnecting with individuals from their past, they were also able to strengthen social connections with current friends and family. For instance, another participant shared a story about visiting her son who began showing her pictures on his email. She said, "*I laughed to myself the whole time because I knew exactly what he was doing, but he thought he was showing me something new*!"

A third participant used ICTs to overcome both social and spatial barriers. She often used email to communicate with her children. Her children commented on how much the class had meant to her and how much she had enjoyed learning again. She had also begun to use ICTs to overcome spatial barriers. Before moving into an AIC she was a regular traveler and particularly enjoyed visiting art galleries and museums. No longer able to do this she felt isolated from this former interest. We helped her find several museum websites and locate pictures by favorite artists. She soon found that she could look at art around the world, tour museums, and even check up on her childhood home with Google Maps satellite view. During one session she spent all of her time searching for paintings by Edouard Manet. She and her daughter both commented on her enjoyment of this:

> Mrs. T. "*This is so fascinating. It's opened up a whole new world*."
>
> Mrs. T's Daughter: "*You've enriched my mother's life*."

The participant who had used email to reconnect with church and community friends also used ICTs to overcome spatial barriers, visiting the website of his former church and seeing pictures of a recent renovation. Using ICTs to overcome this spatial barrier also assisted him in overcoming a social barrier, as he was now able to discuss the renovation with the people with whom he had reconnected. Thus, neither social nor spatial barriers seemed to predominate at AIC 2. Both were of concern and ICTs were used to overcome both, sometimes by the same person.

AIC 3

AIC 3 was distinctly different from the first two AICs as it incorporated a lower level of assistance known as independent living. AIC 3 was much larger than the previous two AICs with multiple floors and was distinctly divided between assisted living and independent living. Both sides were bright, but offered little sitting room (except a prominent lobby) in which residents could interact, although the independent living side had a small, well-maintained library. The overall structural feel of AIC 3 was more like an apartment complex or dorm rather than like a home or community. AIC 3 was notably isolated. It was located at some distance from any kind of shopping, professional offices, or neighborhoods, on a busy four-lane road near the top of a steep hill. Most assisted living residents were entirely dependent on either family or AIC transportation (which seemed fairly frequent), while several independent residents actually had their own cars.

While we observed little interaction across assisted living and independent living lines, there was some sense of cohesion and interaction within the two groups. The residents appeared to interact frequently, as it was typical to see small groups gathered outside the main building or in one of the lobbies and hallways. There was not as much of a sense of community or activity as we had experienced at AIC 1, although the activities director (one for assisted living, one for independent living) kept a full calendar of activities. Many study participants would arrive early for the training sessions, sit in the hallway, and observe as we set up the training lab. Participants were engaged and enthusiastic with small group interactions almost every session. The overarching sense from AIC 3 was the use of ICTs to overcome social barriers and re-establish or strengthen connections with others, with spatial barriers being overcome more through other means such as personal or institutional transportation. As with AIC 1 and AIC 2, many participants primarily used the computer and email to reaffirm and maintain contact with social network members. One of the participants from AIC 3 received an email from her grandson which contained ultrasound pictures of her first great-grandchild. After opening the picture, the participant looked around the room and said, "*Isn't it wonderful, isn't it wonderful*?" In addition to helping her connect with family, it also helped her bond with other class participants who gathered around her to view the ultrasound picture, leading her to say "*(Using computers) … opened a new door in my life*!"

Other participants also used email to send and receive pictures of children, grandchildren, and other family members. A few independent living residents experimented with creating social network accounts. In particular, two of the residents came into an office hour session to work together and simultaneously create Facebook accounts to keep in touch with family members; they were surprised to learn that, through Facebook's search engine, they could also reconnect with old high school friends and old co-workers, and both participants were surprised when a simple search of their old high school turned up profile results on people they had lost touch with years prior. Of these two independent living residents, one was so inspired by this that she came in the very next week to create an Eons (a social network directed at baby-boomers and older adults) account and search for more of her old friends.

Email and social networking sites were not the only means people used to overcome social barriers, as a few residents used Google to search for websites and personal blogs of family members and friends. One participant from the assisted living side had been an active

member in a woodcarvers' group before coming to AIC 3 and was unable to attend group meetings and craft shows any longer. We helped him search and find the website for his woodcarver's organization. Once on the website, the participant browsed craft show picture albums while naming people he recognized, even finding pictures of himself. The website had archives of old newsletters containing his "*buddy's*" email address. He emailed his "buddy" that day and by the next office hours session his buddy had replied to him.

As at the other two locations, there were examples of participants using Google searches to find old communities and religious groups and overcome spatial barriers, but these were not predominant. During one office hour session, one independent living resident used Google to find a website that housed video performances of church singers, as one of the videos featured an old family friend. During another office hour session, an assisted living resident used Google to read a local news story to which she previously had no access.

DISCUSSION AND CONCLUSIONS

The predominant interest in what ICTs could be used for seemed to be related to which type of barrier (social or spatial) seemed to predominate at each AIC. At AICs with little social interaction (i.e., more social barriers), there seemed to be a greater interest from the class as a whole in learning to use ICTs to overcome social barriers and connect or reconnect with others. In AICs that were physically isolated, with limited transportation options (i.e., spatial barriers) class participants were more likely to use ICTs to "get out of the house," to visit cultural sites or old neighborhoods. Where transportation seemed to be available this was less of an issue. Of course, these interests are not mutually exclusive and sometimes individual concerns seemed to run counter to the barriers at the AIC, leading a participant to pursue more personal interests with regard to ICTs.

Social Barriers

ICT usage has the potential to transcend social barriers and replace social isolation with connection to a broader and potentially meaningful online community, renew prior relationships, and enhance and enlarge familial communication (Chaffin & Harlow, 2005; White et al., 1999). The results of our qualitative data support these findings for residents in AICs. The ways in which they can communicate have increased. We have seen the technology serve as a bridge to AIC residents' past lives and allow residents to communicate and reconnect with social network members from the present and the past.

Relationships may be formed around shared experience. The ICT training provided a shared experience for participants and has led in some cases to new relationships being formed among residents. This has varied greatly from location to location, but has still been frequent enough to warrant inclusion as an example of the ICT training providing a way for participants to overcome social barriers and make new friends within their communities.

We have noticed across communities a sense of "connectedness" in which the participants feel that they are now more integrated into the larger world. Participants from each AIC noted this greater sense of connection to the world at large: When asked, "Has the use of the Internet changed your life in any way? If so, how? Why?" Their responses were startling:

Mrs. M. responded, "*[We are] not as close to the grave as we thought*."

Mrs. W. "*We feel like we've joined the human race*."

Ms. P. "*I may be old, but I feel like I have accomplished something." "My whole family has computers –I feel like I have accomplished something*."

Such responses are indicative of a shift in attitude from one of circumscribed life space, defined by the social barriers of AIC living, to one that can encompass a larger social world. This new knowledge of ICTs creates a shared understanding between the participants and "the world" of people who are online and know how to use computers and the Internet. This connection provides participants a way to overcome social barriers and reduce isolation without necessitating finding new social ties. The mere fact of being "online" means some kind of shared experience and connection has been formed.

While social scientists have examined social isolation and disconnectedness (Cornwell & Waite, 2009), neither of these categories seems to reflect this feeling of connectedness to the world. There is a sense that their world is small (not simply physically, but also mentally or philosophically) and that life, events, and changes in the world are passing them by. These perceptions seem to further distance them from the general public. ICT training helps alleviate this societal isolation, but can also have a positive effect on the sense of isolation caused by spatial barriers.

Spatial Barriers

Institutionalization often increases isolation (Bradley & Poppen, 2003), coinciding with loss of car or other modes of transportation (Burnett & Lucas, 2010). Residents' movement in and out of their community is limited and thus spatial barriers begin to form because of the lack of ability to change the spatial location. Because of age and physical limitations, most residents are unable to travel frequently (Burnett & Lucas, 2010).

ICTs may be well-suited to helping individuals overcome spatial barriers, and we found some support for this in our data. As noted previously, one resident at AIC 2 had shared with us that she used to love to visit museums and enjoy art, but that she had not been able to do that for quite some time due to physical ailments. She was "*very thankful that she can look at art online because she doesn't think she will ever be physically able to travel to these museums again*" because of failing health. This example highlights how spatial barriers arise not just from factors such as physical isolation or lack of transportation, but also from health declines that limit a person's ability to travel. This may be especially true among residents of assisted living who, by definition, have greater limitations in activities of daily living.

Participants were often amazed at what could be discovered through the use of Google Maps and satellite views. One resident at AIC 1 had not been able to make the trip back to her hometown (2 hours away) in some time. She had heard many things had changed in the town and had been told by others what it looked like. Upon learning about Google Maps, she asked what she could see. Later that afternoon, she took her "hometown tour" courtesy of Google Maps Street View. She was able to 'walk' down Main Street and see her church.

While ICT use does not eliminate spatial barriers, it does allow participants an opportunity to transcend some of the most significant barriers and feel as if they are again a part of the world outside the AIC. As residents commented:

Mrs. C. "*There's another world out there*."

Mrs. M. "*You have opened up our world*."

Limitations and Further Research

Our results are based on a small number of participants at three AICs with different AIC characteristics; having a larger number of participants and AICs would enhance the understanding of these processes. We do not have data to examine whether the participants continue to use ICTs to overcome social and spatial barriers, and how health status changes interact to impact this usage. We suspect that health declines diminish the usage of ICTs for overcoming these barriers over time.

While social and spatial barriers became apparent during the course of the larger study, examination of the ways in which ICTs may be used to overcome social and spatial barriers was not an original purpose of the larger study. Further research could look specifically at this question by employing an intervention aimed specifically at teaching older adults in AICs to use ICTs to overcome social and spatial barriers, keeping in mind the influences of AIC-level characteristics.

In addition, research using technologies such as Skype that could allow people to "attend" events such as weddings and funerals, would be useful in examining the effectiveness of these technologies in allowing AIC residents to overcome social and spatial barriers. As part of the larger study from which the current data were derived, future analysis of quantitative data will also explore in detail how ICT use affects various aspects of quality of life.

Conclusions

The results of this study suggest that community level characteristics exert a great deal of influence over whether the resident participants were more interested in overcoming social barriers or overcoming spatial barriers and that each of these barriers can be at least partially overcome through training older adults to use ICTs. In addition, this research indicates that participating in ICT training enhances older adults' sense that they are participants in the social world and the social world is not merely passing them by. These perceptions are likely to have significant positive impact on AIC residents' quality of life.

Use of ICTs for older adults in institutional settings may have benefits that transcend just the ability to maintain or increase social networks. Preservation and extension of social networks has the potential to increase quality of life because of more frequent communication with social ties. This paper is based on research in three of six communities with follow-up studies and completion of five waves of study participants. The qualitative evidence gathered thus far supports positive outcomes such as transcendence of spatial and social barriers of AIC life through ICT use. The technology removes some of the barriers presented by limited mobility, allowing residents to communicate more freely with friends and family and the "outside world." Additionally, the ability to become self-described

"computer users" provides residents with a sense of knowledge and power and thus a greater connection to the world. As one participant asserted, "*We don't feel like such misplaced people anymore. We know how to Google—We're modern*." Or, as another participant commented, "*You can teach an old dog new tricks*!"

Acknowledgments

"The project described was supported by Award Number R01AG030425 from the National Institute On Aging. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute On Aging or the National Institutes of Health."

References

Adams KB, Sanders S, Auth EA. Loneliness and depression in independent living retirement communities: risk and resilience factors. Aging and Mental Health. 2004; 8(6):475–485. [PubMed: 15724829]

ALFA (Assisted Living Federation of America). "What is assisted living?". 2010. Retrieved from http://www.alfa.org/alfa/Default.asp

Ball MM, Whittington FJ, Perkings MM, Patterson VL, Hollingsworth C, King SV, Combs BL. Quality of life in assisted living facilities: Viewpoints of residents. Journal of Applied Gerontology. 2000; 19(3):304–35.

Blaschke C, Freddolino P, Mullen E. Ageing and Technology: A Review of Research Literature. British Journal of Social Work. 2009; 39:641–656.

Bradley N, Poppen W. Assistive technology, computers and internet may decrease sense of isolation for homebound elderly and disabled persons. Technology and Disability. 2003; 15(1):19–25.

Burnett P, Lucas A. Talking, walking, riding, and driving: The mobilities of older adults. Journal of Transport Geography. 2010; 18(5):596–602.

Campbell RJ, Wabby J. The elderly and the internet: A case study. The Internet Journal of Health. 2003; 3(1) Retrieved from: http://www.ispub.com/journal/the_internet_journal_of_health/archive/volume_3_number_1_22.html.

Cannuscio C, Clock J, Kawachi I. Social capital and successful aging: The role of senior housing. Annals of Internal Medicine. 2003; 139(5:2):395–400. [PubMed: 12965964]

Carstensen LL, Fung H, Charles ST. Socioemotional selectivity theory and the regulation of emotion in the second half of life. Motivation and Emotion. 2003; 27(2):103–123.

Chaffin A, Harlow S. Cognitive learning applied to older adult learners and technology. Educational Gerontology. 2005; 31(4):301–329.

Chapin R, Dobbs-Kepper D. Aging in place in assisted living: Philosophy versus policy. The Gerontologist. 2001; 41(1):43–50. [PubMed: 11220814]

Chen S, Brown JW, Mefford LC, de La Roche A, McLain AM, Haun MW, Persell DJ. Elders' decisions to enter assisted living facilities. Journal of Housing for the Elderly. 2008; 22(1, 2):86–103.

Climo, J. Distant parents. Piscataway, New Jersey: Rutgers University Press; 2001.

Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health. Journal of Health and Social Behavior. 2009; 50:31–48. [PubMed: 19413133]

Davidson, CM., Santorelli, MJ. The impact of broadband on senior citizens, A Report to the U.S. Chamber of Commerce. 2008. Retrieved from www.nyls/user_files/1/3/4/30/83/BroabandandSeniors.pdf

Folstein MF, Folstein SE, McHugh PR. 'Mini-mental state': a practical method for grading the cognitive state of patients for the clinician. Journal of Psychiatric Research. 1975; 12(3):189–198. [PubMed: 1202204]

Hawes, C., Phillips, CD. High service or high privacy assisted living facilities, their residents and staff: results of a national survey. Research Report Prepared for *HHS/ASPE/DALTCP*. Miriam Rose

Myers research Institute. 2000. Retrieved from the U.S. Department of Health and Human Services: http://aspe.hhs.gov/daltcp/reports/hshp.pdf

Kassner, E., Reinhard, S., Fox-Grage, W., Houser, A., Accius, J., Coleman, B., Milne, D. A balancing act: state long-term reform. AARP. 2008. Retrieved from http://assets.aarp.org/rgcenter/il/inb161_ltc.pdf

Knight T, Mellor D. Social inclusion of older adults in care: is it just a question of providing activities? International Journal of Qualitative Studies on Health and Well-Being. 2007; 2(2):76–85.

Melenhorst, AS., Rogers, WA., Caylor, EC. The use of communication technology by older adults: exploring the benefits from the user's perspective. Proceedings of the human factors and ergonomic society- 45th annual meeting. 2001. Retrieved from http://www.cc.gatech.edu/fce/ahri/publications/mele_rog_cay_01.pdf

Mitchell JM, Kemp BJ. Quality of life in assisted living homes: A multi-dimensional analysis. Journal of Gerontology: Psychological Sciences. 2000; 55B(2):117–127.

Nahm E, Resnick B. End-of-life treatment preferences among older adults. Nurse Ethics. 2001; 8(6): 533–43.

Park NS. The relationship of social engagement to psychological well-being of older adults in assisted living. Journal of Applied Gerontology. 2009; 28(4):461–481.

Park, NS., Zimmermn, S., Kinslow, K., Shin, HJ., Rolf, LL. Social engagement in assisted living and implications for practice. Journal of Applied Gerontology. 2010. Retrieved from http://jag.sagepub.com/content/early/2010/10/09/0733464810384480

Selwyn N. The information aged: a qualitative study of older adults' use of information and communications technology. Journal of Aging Studies. 2004; 18(4):369–384.

Sergeant JF, Ekerdt DJ. Motives for residential mobility in later life: post-move perspectives of elders and family members. International Journal of Aging and Human Development. 2008; 66(2):131–154. [PubMed: 18453180]

Stone R, Reinhard S. The place of assisted living in long-term care and related service systems. The Gerontologist. 2007; 47(1):23–32. [PubMed: 18162566]

Ware JE, Kosinski M, Keller SD. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. Medical Care. 1996; 34(3):220–233. [PubMed: 8628042]

White H, McConnell E, Clipp E, Branch LG, Sloane R, Pieper C, Box TL. A randomized controlled trial of the psychosocial impact of providing internet training and access to older adults. Aging and Mental Health. 2002; 6(3):213–21. [PubMed: 12217089]

White H, McConnell E, Clipp E, Bynum L, Teague C, Navas L, Craven S, Halbrecht H. Surfing the new in later life: a review of the literature and pilot study of computer use and quality of life. Journal of Applied Gerontology. 1999; 18(3):358–378.

Wright K. Computer-mediated social support, older adults, and coping. Journal of Communication. 2000; 50:100–118.

Table 1

Intervention Class Characteristics

	AIC 1 (*n* = 7)	**AIC 2 (*n* = 15)**	**AIC 3 (*n* = 21)**
Number of Instructors	1	1	1
Number of Assistants	4	3	3
Instructor-to-Student Ratio	1:7	1:15	1:21
Assistant-to-Student Ratio	1:1.75	1:5	1:7
Instructor/Assistant-to-Student Ratio	1:1.4	1:3.75	1:5.25
Percent Reporting Previous Computer Use	14.3	26.7	72.7

Table 2

Sample Characteristics

Variable	Full Sample Percent or Mean (SD)	AIC 1 Percent or Mean (SD)	AIC 2 Percent or Mean (SD)	AIC 3 Percent or Mean (SD)
***n* (# withdrawn)**	**43 (8)**	**7 (0)**	**15 (6)**	**21 (2)**
Sex				
Female	79.1%	57.1%	93.3%	76.2%
Male	20.9%	42.9%	6.7%	23.8%
Age	83.0 (1.4)	86.1 (1.1)	82.1 (2.4)	82.7 (2.2)
Time in AIC	2.5 years (0.5)	3.0 years (1.1)	1.5 years (0.8)	3.0 years (.8)
Economic Resources				
More than enough to get by	33.3%	57.1%	33.3%	25.0%
Just enough to get by	61.6%	28.6%	66.7%	70.0%
Not enough to get by	5.1%	14.3%	0.0%	5.0%
Marital Status				
Married	4.7%	28.6%	0%	0%
Widowed	69.8%	71.4%	66.6%	71.4%
Divorced	11.6%	0%	20.0%	9.5%
Separated	2.3%	0%	6.7%	0%
Never Married	11.6%	0%	6.7%	19.1%
Race/Ethnicity[a]				
White (Non Hispanic)	90.7%	100%	93.3%	85.71%
Education				
Less than H.S.	9.3%	14.3%	13.3%	4.8%
H.S. Graduate	18.6%	14.3%	20.0%	19.1%
Some College	37.2%	28.6%	33.3%	42.9%
College Graduate	16.3%	0%	13.3%	23.8%
Post-graduate	18.6%	42.9%	20.0%	9.5%

[a]Three respondents at AIC3 answered Native American, though there may have been a misunderstanding of the question, as one of the respondents indicated that they answered this way because they were “born in the United States.”

Table 3

AIC Characteristics

	AIC 1	AIC 2	AIC 3
Size, Affiliation	Medium-sized, religious affiliation	Small, corporate-owned	Large, corporate-owned
Staff	Dedicated AD[a] who was very involved with residents	No dedicated AD, little involvement with residents	Two dedicated ADs, moderate involvement with residents
Social	Much activity, social interaction	Little activity, social interaction	Large number of activities, little social interaction
# Activities/wk	32.4	22.5	52.8
Quality of Activities	Interactive/engaging, (e.g., guest speakers, mixers)	Time passing (e.g., TV watching, CD sing-a-longs)	Mix of time-passing, interactive, engaging – not heavily promoted
Spatial	One level	One-level	Multi-level, large
	Isolated by busy roads, slight hills	Isolated by location, steep hills	Isolated by location, distance, steep hills
	Open, staffed entrance	Locked, coded entrance, not-staffed	Open, staff entrances
# of Residents	AL: 61	Site 1-AL: 40; Site 2-AL:36	AL: 58; IL:98

[a]Activities Director

Table 4

AIC Barriers and ICT Emphasis

	AIC 1	AIC 2	AIC 3
Barrier Level			
Social	Low	High	High
Spatial	High	High	High[a]
ICT Emphasis			
Social	Low	High	High
Spatial	High	High	Low

[a]Mitigated by regularly provided transportation