

# The Impact of Computer Training and Usage on Quality of Life among Older Adults

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## **Introduction**

For the first time, a majority of American older adults have become regular users of the internet (Pew, 2012). This represents an important shift in how older adults view and utilize technology. At the same time, when compared to other age groups, older adults still grossly underutilize technological advances (Czaja, 2006). Thus, even with the consistent increase seniors going online, technological advancements which hold the possibility of enhancing older adults' quality of life and reducing social isolation may not reach many older adults who could benefit from them. Further, social isolation and loneliness have been major challenges for ageing populations across the globe, and many of these technological advances may provide new and innovative tools to combat these difficulties. This brief report discusses the impact of introducing tablet computers and providing training on quality of life (life satisfaction, optimism, mastery and computer engagement) and mood (depression and loneliness) among older adult members of a senior residential community.

### *Quality of Life among Older Adults*

In addition to maintaining cognitive and physical health, social engagement is a key element of successful aging, as it not only gives life meaning, but also allows older adults to connect with those around them (Rowe & Kahn, 1998). Social engagement, generally defined as the carrying out of meaningful social roles for either productive or leisure activity, was added to the concept of optimal aging to highlight the importance of both social support and social activity. Evidence is

mounting that engagement, particularly social engagement, positively impacts quality of life as well as mortality (Glass et al., 2006). Accordingly, efforts to increase social engagement among older adults are among our highest societal priorities.

### *Promoting Social Engagement through Technology*

One potential pathway to greater elder social engagement may be through the use of technology. The use of computers can promote social engagement by helping older adults more effectively navigate the world around them to maintain stronger social ties. Further, using computers may promote stronger connections between older adults and their family and friends, through both social networking and by providing greater access to information (Czaja et al., 2006; Kautzaman, 1998). Numerous studies with older adults confirm the role of technology in increasing self-esteem, life satisfaction, and perceived autonomy as well (Sherer, 1996; McConatha, McConatha & Dermigny, 1994). Modern technologies also promote social engagement by helping older adults ensure more safety at home and can assist in facilitation and utilization of health care (Czaja et al., 1996).

### *Dissemination of New Technologies among Older Adults*

Simply put, technologies that can improve quality of life by combating isolation and increasing socialization are rendered useless if older adults choose not to utilize them. The Accelerating Diffusion of Proven Technologies (ADOPT) model

is the most recent and comprehensive attempt to delineate best practices in technology diffusion for older adult populations (Wang et al., 2010). The ADOPT model introduces three major factors required to accelerate and facilitate technology use among older adults. First, the level of motivation older adults possess is key to this population learning about and accepting newer technologies. Very few technologically advanced products are designed specifically for older adults, and the use of many of these products assumes a certain level of familiarity with technology more commonly absent among this population. As a result, many older adults believe that the time and energy required to learn the use of a given technology may be greater than the benefits eventually received (). Motivation can be achieved and maintained by shortening the learning curve and highlighting the benefits brought forth by the technology. Secondly, the ADOPT model highlights the need for collaborators to work directly with older adults. These can be family members, friends, or anyone with greater technological knowledge than the senior and a willingness to share that knowledge. Often the collaborators can improve the senior's motivation to learn by practicing patience and providing clear examples of benefits gained through the use of technology. The final factor of the ADOPT model involves the context or environment in which the older adult lives. If technology is commonly used, accepted and understood throughout the environment, it is believed to be easier to teach to any resident of that environment, old or young.

The training program employed for this project was designed to impact all three factors from the ADOPT model. The *Connected Living* program, developed for use in senior living communities, uses 'technology ambassadors' (defined in the ADOPT model as collaborators) to work closely with older adults to enhance social connections and reduce social isolation by introducing new computer programs and technologies. By working with small groups of seniors and highlighting the ways in which computers and the Internet can facilitate stronger connections to friends and family, technology ambassadors first seek to improve levels of motivation to learn. In fact, research clearly indicates that learning is most successful when the students are motivated and can see clear benefits to the knowledge and skills to be attained (). The *Connected Living* program is also designed to change the culture of senior residences by reducing fear of technology. By providing education and information about effective use of computers and helpful computer programs, the residents of the community are exposed to technologies that may assist with social connection, gathering of health information and numerous other possibilities.

In this project, we hypothesized that older adults enrolled in a twelve-week introductory course designed to teach effective tablet usage would show improved quality of life as measured by scales of life satisfaction, optimism, mastery and computer engagement as well as reductions in depressed mood and isolation as measured by depression and loneliness scales.

## **Method**

### *Design*

A repeated measures quasi-experimental design was used in this study, employing control and experimental groups. All participants were given a survey at baseline, at six weeks and at three months. Only the experimental groups were given access to the tablet computers and the classes. The participants all lived in the same residence and were chosen for the project by staff members. This project took place in an assisted-living residential facility for older adults located 30 minutes from a major Midwestern city. Twenty-five older adults were chosen randomly out of a pool of approximately fifty residents who had volunteered to attend a computer training course. Another twenty-five older adults from the original list were asked to serve as controls and received no formal computer training over the twelve weeks. Five individuals declined to participate in the control group and did not participate in the study. Both groups were able to access the computers designated for residents' use over the twelve-week span.

### *Participants*

The experimental group had a mean age of 79.71 ( $SD = 12.20$ ) and the control group reported an average age of 83.00 ( $SD = 8.00$ ). The experimental group consisted of 19 women and 6 men and the control group consisted of 17 women and 3 men. At baseline the groups did not differ significantly in months living at the residence or upon any of the measures utilized with the exception of

depression. The control group reported significantly lower rates of depression, though both groups were below the generally accepted cut-off scores for clinical depression (See Table 1).

### *Procedure*

Study measures were administered to all participants at baseline, at six weeks and at three months. The classes met once a week for 90 minutes in a conference room at the residence for twelve consecutive weeks. Study participants were given Hewlett Packard (HP) Slate Tablets for the project. None of the participants owned or had used a tablet computer regularly prior to the introduction of the PC tablet. Originally four classes comprised of five participants each were created. However, it became apparent at the halfway point of the project that some participants required added time to practice and solidify weekly lessons, so bi-weekly open sessions were added in the final six weeks. In total, 105 class sessions were taught over the twelve weeks.

### **Measures**

Life Satisfaction- The Satisfaction with Life Scale was used to assess life satisfaction. This 5-item likert scale provides options for each question; strongly agree, agree, disagree, and strongly disagree. This scale has shown strong internal reliability (alpha coefficient .87) and moderate temporal stability ( $r=.82$ )(Pavot & Diener, 1993).

Positive Outlook on Life- The Optimism Scale was used to assess positive outlook on life. This scale is composed of 12 items. It includes four filler items and four items reversed prior to scoring. This measure has reported a Cronbach's Alpha of .76 and a test-retest reliability of .79 (Scheier & Carver, 1985).

Mastery- Mastery was assessed using the seven item Self Mastery Scale. This measure is designed to assess the extent to which an individual feels as if they manifest personal mastery over life outcomes. This is a widely used measure which possesses good reliability and consistency (Pearlin & Schooler, 1978).

Computer Engagement- The Flow Short Scale was used to determine comfort felt while using a computer. This 10-item measure has been utilized to measure flow, or fully immersed engagement during a variety of activities. Seven items measure perceived amount of flow and three items measure perceived importance of flow. Only the perceived amount of flow items were reported in this study. Cronbach's Alpha has been reported at .92 (Engeser & Rheinberg, 2008).

Mood Assessment Scale- The Geriatric Depression Scale was used to assess depressive affect. This 10 item scale asks respondents to answer Yes or No to a series of questions about how they feel right now. The measure has high internal consistency at .91 as well as high test-retest reliability at .85 (Parmalee, Lawton and Katz, 1989).

Loneliness/Isolation- The UCLA Loneliness Scale was used to examine feelings of loneliness and isolation. This 3 item scale provides three choices for each question; (agreement) most of the time, some of the time, or none of the time. This measure has demonstrated high internal consistency (alpha coefficient ranging from .89 to .94) and test-retest reliability ( $r = .73$ ) (Russell, 1996).

Physical and Emotional Health- The SF-36 Health Survey- short version was used to briefly assess mental and physical health. This measure asks four questions: one pertaining to self assessed physical health over the last two weeks, one about emotional health over the past two weeks, one about limitations in social activities associated with physical or emotional health, and one about limitations in activities of daily living associated with physical or emotional health (SF-36 Health Survey, version 2 [SF-36v2]; SF-36 Medical Outcomes Trust, Waltham, MA).

## **Results**

A one way repeated measures ANOVA was conducted to determine the impact of tablet training and usage on life satisfaction, optimism, mastery, computer engagement, depression and loneliness over the three-month study. A main effect was found Incorporating the Greenhouse-Geisser correction (as indicated by the Mauchly's Test of Sphericity results), significant differences between baseline and tablet instruction and use after three months were reported in

optimism ( $F 1, 25 = 6.07, p < .05$ ) and computer engagement ( $F 1, 25 = 3.90, p < .01$ ). Though it did not reach the level of significance, changes in mastery ( $F 1, 25 = 5.20, p = .059$ ) could be considered a trend in the data. No significant changes were found in life satisfaction, depression, or loneliness over the three months.

## **Discussion**

As the number of 'connected' older adults continues to grow the results of the study are both timely and important. Over a rather short period of time, seniors introduced to the tablet computers reported improvements in several areas associated with quality of life. Optimism increased and improved mastery was noted as a trend, which suggests the possibility of a broad, positive impact associated with the training and subsequent use of the tablet. Perhaps less surprisingly, participants also showed improvement in computer engagement. This indicates that older adults can learn to use cutting edge technology effectively and that use of that technology can potentially improve their views of themselves as well as the world around them.

Though not the main focus of this report, the type of training employed was also quite likely responsible for the positive findings. As indicated by the ADOPT model, older adults can learn to use newer technologies most effectively when properly motivated and taught over longer periods of time in a comfortable context.

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