

The 60's are the new 20's: Teaching older adults technology

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The purpose of this article is to present the existing practice-based and empirically based literature on teaching technology to seniors to determine a) what kind of research has been conducted to assess the effectiveness of teaching technology to seniors, b) what biases must be dismantled for younger computer trainers to teach older ones, c) what strategies computer trainers used to assist seniors to understand technology's relevance to their lives, and d) what kinds of research needs to be conducted as technology evolves for future seniors.

Technology has advanced significantly in the past 40 years considering that those born in the 1950s, 60s, and 70s did not grow up with microwaves, cell phones, cable television, or computers. As technology advances, baby boomers and generations after them may find it challenging to keep up with technology. Older adults age 50-100 may attest to this challenge first-hand and be intimidated by the technological advancements. Research data suggest that although seniors in North America are increasingly using technology, these seniors have more challenges than their younger counterparts in learning to operate the Internet, teller machines, and telephone menu systems (Sharit, Czaja, Nair, & Lee, 2003). In 2003, the Pew Internet and American Life Project (2005) noted that only 25% of Americans over the age of 65 were "online", compared to 56% of 30-49 year olds and 36% of those in the 50-to-64 year-old age group.

This literature review focuses on teaching computer technology to older adults. This topic is important to discuss for the following reasons:

1. Older adults have special learning needs that differ from younger adults when it comes to technology. Younger adults have not lived life without technology whereas older adults were introduced to it and are challenged to learn it.
2. The prior experiences of older adults may not necessitate a desire for them to learn new technologies; they have to have a readiness to learn particularly when their lives necessitates that they learn technology (Knowles, Holton III, & Swanson, 1998).
3. Technology is not necessarily presented as a form of experiential learning that is based on the older adults' experience thus making learning technology less embraceable (Huang, 2002).

For the purposes of this review, older adults refer to "the over-50 crowd" while younger adults refer to persons under age 50 (Chin, "The elderly learn to compute" 2010). Computer technology is defined as "information technology is the capability to electronically input, process, store, output, transmit, and receive data and information, including text, graphics, sound, and video, as well as the ability to control machines of all kinds

electronically” (<http://www.answers.com/topic/information-technology>). Fluid intelligence is defined by Sigelman and Rider (2009) as “the ability to use your mind actively to solve novel problems—for example, to solve verbal analogies, remember unrelated pairs of words, or recognize relationships among geometric figures” (p. 246). Crystallized intelligence in contrast is “the use of knowledge acquired through schooling and other life experiences” (Sigelman & Rider, 2009, p. 246). The terms seniors and older adults are used interchangeably.

The purposes of this literature review are to:

1. Describe the limitations older adults have in learning technology;
2. Estimate the efficacy of technological programs for older adults;
3. Evaluate the overall degree of technology’s relevance to seniors; and
4. Describe areas for future research.

Overview of the Literature

This literature review dismantles some of the biases related to teaching older adults technology related to physical, cognitive, and perceptual limitations. What follows is a comparison and evaluation of two technological programs for seniors. In light of that information, the benefits of technology are highlighted. From this discussion strategies are presented with recommendations for further research.

Not surprisingly, each of the literatures does not subsume that one literature is the causation of another. However, a general pattern within each of the literatures emerges. The conclusions of this literature review are as follows: a) seniors may embrace technology if they had a better understanding of how it impacts their day-to-day activities; b) technology programs can assist seniors to develop social networks but it requires that computer trainers dismantle biases they hold against seniors; and c) some seniors are not aware

of the benefits of the senior-friendly technology that exists. In combining these literatures, it appears that seniors are taught to be fearful of what they do not know; that is technology and that this lack of knowledge is impacting seniors socially, physically, and mentally.

The narrative presented below offers explanations why there may be a disconnection of technological knowledge between older and younger adults.

Dismantling Biases About Older Adults and Technology

Technology impacts the lives of older adults in ways they thought unimaginable; in North America, older adults make up 26% of the U.S. population (Chin, “The elderly learn to compute, <http://findarticles.com>). More specifically, there has been rapid growth in the number of people 50 years of age and older living in the United States (Craig & Dunn, 2007). Technology is responding to these persons with the development of teller machines, “home-monitoring devices, artificial glands, which will dispense medication, or computer terminals, which will allow people to stay home and work” (Chin, “The elderly learn to compute, <http://findarticles.com>). The Pew Internet and American Life Project (2005) indicated that the number of senior citizens who used the Internet increased by nearly 50% between 2000 and 2004. But some senior citizens are not so quick to log on since “they aren’t aware that they need the Internet. Since they don’t know why having a PC at home would be useful, many seniors choose not to purchase one” (Anonymous, “Wiring the Elderly”). There are additional stereotypic sentiments surrounding the limitations of older adults learning technology across physical, cognitive, and perceptual limitations.

Physical Limitations

Just as an old dog can be taught new tricks, older adults can be taught new aspects of

technology. Greg Kearsley and Mary Furlong made this determination in the 1980s when they taught computer classes to the elderly in San Diego during a six-week period to 400 older adults. Among their findings was that “physical limitations had no effect on the elderly’s ability to learn. People with arthritis were still motivated to punch keystrokes and make the computer respond” (Chin, “The elderly learn to compute, <http://findarticles.com>). The older adults were also motivated by the day-to-day activities they are engaged in such as: letter writing to relatives, seeking to create databases for their local clubs and churches, maintaining files for recipe collection, and financial planning (Chin, “The elderly learn to compute, <http://findarticles.com>).

To accommodate some of the older adults’ special needs, Kearsley and Furlong repeated instructions, used large-lettering visual aids, and spoke loudly. While Kearsley and Furlong’s observational study has merit, further evaluation of the study’s success should be articulated. Mayhorn, Stronge, McLaughlin, and Rogers (2004) suggest that the first step in designing a computer training program is to determine “the content of the training materials by exploring whether the training is necessary, what goals older adults wish to accomplish, what skills need to be taught, and the characteristics of those who will benefit most from the training” (p. 186).

While Kearsley and Furlong’s study—conducted over twenty years ago—has merit, it does not specify what the technological needs of the older adults were. Jones and Bayen (1998) charge that any computer training workshops should be tailor-made to suit the older adults’ specialized needs.

Another critique of Kearsley and Furlong’s study is that it does not assess the effectiveness of the technological workshops. Mayhorn et al (2004) asserts that “once a training program is in place, evaluation of that program is necessary to ensure that training is effective. To evaluate a

program, measures of successful learning such as retention of information and ease of computer use should be examined” (p. 188).

In sum, as computer technology evolves, so should the level of computer training. Seniors have unique needs that were not considered as part of Kearsley and Furlong’s study. While their study may have been lauded as a success, it is missing this key element. It is not clear how Kearsley and Furlong determined whether their program was successful. Elements of their study may be duplicated to include how one may assess computer training effectiveness.

Cognitive Limitations

Older adults experience a generalized slowing of cognitive processes as measured in perceptual speed computer tasks (Salthouse, 1991). Mayhorn et al. (2004) conducted a study “to assess the perspectives of older adults with respect to computer training” whereby the researchers “conducted a series of intensive structured interviews” in order “to share insight into older adults’ goals and interests concerning computers” (p. 188). They found that a

Barrier to learning that is associated with the rate of presentation is the amount of material presented. Although older adults benefit from training formats that emphasize step-by-step directions on the procedure required to perform a task, long procedures that include a large number of steps might seriously tax working memory, which is the ability to simultaneously store and process information in memory. This contention is evident from comments such as ‘oh, my gosh, do they expect me to remember all this?’ (p. 195)

Spatial ability among some older adults may present a challenge to learning more about technology as quickly as younger adults. “Spatial

ability” in this case means one’s general ability to manipulate images or patterns mentally (Shepard & Metzler, 1971).

Some seniors may be challenged to learn technology due to declining cognitive skills since they may not be aware of how technology can monitor how seniors access technology through wireless communication. Mead, Spaulding, Sit, Meyer, and Walker, (1997) researched how the effects of age impacts the computer training of seniors. As part of their study, they had 11 older adults and 15 younger adults who never accessed the Internet and asked them to use an experimental web site to navigate to find the answers to nine questions. Mead et al. (1997) added that:

The site was roughly hierarchically organised [sic] with a ‘home’ page at the top of the hierarchy, several index pages at the next lower level, and primary and secondary content pages making up the third and fourth levels. A variety of common web navigation tools allowed searchers to access pages at various levels in the hierarchy. Pages further up in the hierarchy allowed access to a larger number of other pages than those at lower level. (p. 559)

Their study found the following: 1) older adults were just as likely as younger adults to complete the computer assignment using two or fewer moves (that is, hypertext links and the number of pages to scroll); 2) older adults were less likely to complete the computer assignment if it required three or more moves; 3) older adults revisited hypertext links and scrolled through more pages to find an answer than did younger adults; and 4) older adults had a greater challenge recalling previous Internet actions like revisiting previously viewed websites.

Czaja, Charness, Fisk, Hertzog, Nair, Rogers, and Sharit (2006) conducted a similar study

where they investigated the factors predicting the use of technology among 1,204 persons ages 18 to 91. Each of the participants completed an inventory which asked them their demographics, health status, technological experience, computer attitudes, and cognitive abilities. They found that the following cognitive elements were salient predictors: fluid intelligence, crystallized intelligence, and computer anxiety.

Perceptual limitations

Computer trainers of older adults should consider being sensitive to the perceptual limitations of older adults. One way to exhibit such sensitivity is avoid the usage of technical jargon when teaching older adults to use computer technology (Morris, 1994). Not all older adults will understand what bytes and URL’s are and may conclude that they “could use the electricity in a home without understanding how to put the wiring in” (Mayhorn et al. 2004). To dismantle older adults’ perceptual limitations, an anonymous writer of the Library Technology Reports (2004) suggest a trainer to provide the following:

1. The history of computer, using the fact that computers were invented and developed by contemporaries of today’s seniors;
2. Discuss the ways seniors are using computers. Log onto a few websites that older adults could use to track medical insurance, keep current with finances, and research hobbies;
3. Demonstrate e-mail. Arrange for a colleague in another part of the building to receive your e-mail and respond to a question posed by a senior; and
4. ravel to some of the many senior-focused websites on the Internet. (p. 35)

Strategies for Teaching Older Adults Technology

Many older adults can and will learn to use computers. However, due to changes that occur

with aging (Craig & Dunn, 2007), they require repetition and practice for new skills to become automatic (Bean & Laven, 2003). A number of studies indicate that older adults require more time to acquire basic computer skills, make more mistakes, and need more teacher support lessons than do younger adults (Clark, 2002; Kelley & Charness, 1995). Jones and Bayen (1998) offer nine recommendations for teaching older adults to use computers:

1. Break up instruction into small units with specific goal and relate new information to older adults existing knowledge.
2. Allow sufficient time during instruction for older adults to process events and information.
3. Provide more pauses during lectures so that older adults have time to take notes and allow them to ask questions during instruction to help clarify information.
4. Minimize the amount of reading required during instruction—or provide extra time for reading.
5. Allow older adults to practice each unit after it has been taught.
6. Adjust the “control panel” settings to accommodate older adults’ needs.
7. Select computer programs, and options within programs, that use menu systems or graphical user interfaces instead of command languages. Select fonts and styles that are easy to read.
8. Familiarize older adults with online help features that accompany most computer programs.
9. Be aware of and regulate other environmental distractions in the classroom such as necessary movement, extreme temperatures, and poor lighting. (p. 675-689)

While these steps can not ensure individual success for older adults, collectively these steps might play a role in making access and use of computers easier for older adults. MacMillian (2006) adds that these steps can assist seniors

with becoming more comfortable as more of the baby boomers reach age 60; by that time, seniors will be more technologically savvy.

There needs to be a program evaluation and analysis of the effectiveness of teaching technology to older adults. While more distance education centers are offering computer courses to older adults, more research is needed to determine the strengths and opportunities for improving those programs. Further, there needs to be research on what equitable access to these programs look like: Gorski (2005) elaborates that equitable access is those actions that maintain a present and lead to a future in which all people across all diversities can engage in each of the following:

1. Enjoy equitably safe, comfortable, encouraged, and encouraging, non-hostile, and valued physical, cultural, and social access to information technology including software, computers, and the Internet;
2. Enjoy equitably affordable access to the resources they need, including adaptive and assistive tools, to take full social, cultural, educational, and economic advantage of computer and Internet technology;
3. Are guaranteed that these conditions will be constantly monitored, examined, and ensured through a variety of perspectives and frameworks (p. 54).

Gorski offers solid suggestions, but Literacy Technology Reports (2004) provide some suggestions on what an equitably scenario looks like to help older adults have optimal success with computers:

1. Foremost, assure that adequate lighting exists. Most seniors do not feel comfortable with mood lighting.
2. Purchase a large monitor....A monitor that is 17 inches or larger is preferred and if budget allows, a flat-screen is preferred.

3. Provide adjustable chairs to minimize disk pressure and static muscular effort.
4. Configure the computer to allow the user to adjust the brightness and contrast of the display with a touch of a button is important.
5. Use large print key tops....The peel-and-stick key tops, priced at under \$20, are a viable solution.
6. Replace the mouse with a trackball.
Reducing the amount of force required to perform mouse tasks can help alleviate strain and prevent injuries.
7. Allow staff to activate Microsoft's Windows accessibility products when needed and education patrons who own personal computers with Microsoft installed that they can activate said features with a few keystrokes. (p. 36)

Future Research for Teaching Older Adults to Use Computer Technology

Technology and seniors go hand-in-hand today. Additional research is needed to assess how seniors interact with technological advancements such as Facebook, Skype, Twitter, Classmates.com, GPS, and several others. As the number of more seniors' contemporaries decline due to illness or death, further research is needed to determine how technological usage assist seniors with setting up a computer profile to remain in contact with classmates, kids, grandkids, and other relatives. In this vain, technology keeps them from being isolated; after all, seniors are living longer.

In addition, technology has to be user friendly with seniors by continuously evolving into new and improved ways for seniors to grasp it better and for them to see how technology improves the quality of their lives. For example, technology from a marketing perspective should employ research on the salability of Blackberries to seniors aged 55-75 if larger keypads were place on them. Facebook, for example, can assess how the percentage of seniors are using the site

and compare it to the number of seniors using it after they make senior-friendly changes in instant messaging.

In addition, seniors' should have more of a say in how they want technology to service their day-to-day activities. Henry Kautz charges that one of the major factors that determines whether an elderly person enters a nursing home is incontinence. Incontinence can be controlled by prompting the person to go to the bathroom at regular intervals. Technology that discretely provided such prompts would help many people extend the length of time they can continue to live in their own homes (MacMillan, 2006, p. 6)

If seniors are able to articulate how they want technology to assist them, then perhaps more seniors can become more comfortable with technology as others witness how technology enriches the lives of seniors.

Concluding Comments

The purpose of this article is to present the existing practice-based and empirically based literature on teaching technology to seniors to determine a) what kind of research has been conducted to assess the effectiveness of teaching technology to seniors, b) what biases must be dismantled for younger computer trainers to teach older ones, c) what strategies computer trainers used to assist seniors to understand technology's relevance to their lives, and d) what kinds of research needs to be conducted as technology evolves for future seniors.

Based on available, but a modicum of data, I speculate that the key elements that should be a part of any computer training for seniors include larger screens, larger keyboards, self-rated health questionnaire where seniors tell how they wish to be accommodated, learning styles inventory that assesses how seniors best learn, repetition of steps, discussion of how technology can improve seniors quality of life, and practical application of

what they have learned. These elements are not inclusive yet subject to empirical investigation. As the baby boomers become older, researchers, colleges, and community centers offering computer training for seniors may conduct action research to document what computer training strategies worked for the demographics of seniors they seek to serve.

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