EVALUATION OF A COMPUTER COURSE FOR INCREASED COMPUTER USAGE BY OLDER ADULTS.

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Abstract

The objective of this pilot study was to evaluate an introductory computer course's impact on older adult perceptions of comfort in using a computer and determine the potential ongoing impact of the course on their computer usage. In this non-experimental post intervention pilot study, 11 participants completed a computer course and then a researcher - developed paper questionnaire that measured computer use history, access, usage, and comfort level in using a computer. Data were analyzed using the SPSS statistical analysis program, with descriptive and comparative statistical tests conducted. No statistically significant reported pre-post differences were found, likely due to the small number of respondents, but most participants perceived their comfort level had increased with the course. It is inconclusive, however, as to whether this course increased participants' time spent using a computer. Despite the small size of this pilot study, insight was gained into various challenges potentially impacting older adult computer usage. The number of free text comments provided on the survey tool by subjects indicates a more narrative qualitative approach may be appropriate for follow-up research.

Keywords: computer, older adults, comfort, computer usage, pilot study, computer course

Background

Technology is rapidly evolving, particularly computers and computer software technology. Information and communication technology (ICT) is increasingly playing a significant role in most modern and developing societies (Soares, Jacobs, Nägle, & Schmidt, 2012). Computers have become more portable and affordable, with this facilitating easy access to a wealth of information. Everyone, but especially older adults who are no longer working, could use computers to facilitate the initiation, maintenance, or improvement of social networks; facilitate life-long learning, and ensure access to health care information (Rosenthal, 2008). Many older Canadians use the Internet, and many use email to communicate with others (Kim, 2008). Access to the Internet through a computer can help reduce older adults' risk of social isolation and it may also improve relationships with family and friends (Czaja et al., 2006). As computer usage has many potential benefits for older adults, it is important for researchers to understand why some older adults have difficulty using computers or are unwilling to use them (Czaja et al., 2006).

There are many challenges associated with computer use for people of all ages. It can be a challenge to keep up with computer and software developments as a result of ever-changing technology. Older adults may also have physical limitations of aging such as reduced finger

dexterity and/or poor eyesight as challenges regarding computer usage (Wang, Rau, & Salvendy, 2011). Cognitive barriers to learning may also occur with pathological aging; such as prolonged reaction time, decreased memory, and decreased mental capacity (Weinstein, 2004). These factors can slow the learning process, making it more difficult for older adults as compared to younger adults to quickly adapt to technological advances. In addition to creating problems with information processing, the aforementioned aging factors may also contribute to decreased confidence in adults who would otherwise be interested in learning how to use computers (Wang et al., 2011). Other factors may hinder an older adult's usage of computers including a lack of access, significant changes in their life such as divorce or bereavement, prolonged non-use, frustration with the equipment, and frequent major software changes (Segrist, 2004).

Computer courses that successfully provide suitable support and exposure to computers may help to reduce feelings of anxiety or uncertainty in novice users (Wood, Lanuza, Baciu, MacKenzie, & Nosko, 2010). These courses may contribute to removing barriers surrounding technology usage by providing information and skills practice to assist older adults in learning about and maneuvering around complicated technologies. Community-based courses have the potential to support adult independence by maintaining social and physical function so that older adults can continue to perform activities of daily living (Baker, 2005). Current literature does not reveal how such courses are designed to ensure ongoing computer use nor explore older adult perceptions of comfort over time after they have taken a course to see if the effects are long lasting. Information is needed to support the development of courses that suit the needs of older adults.

The Seniors Association of Greater Edmonton (SAGE) offers various community-based courses for older adults, one of which is a beginner-level computer course. This course was evaluated in 2015. A paper survey was designed to explore the impact of this course on the older adult participants. The course was held in the SAGE building, located in downtown Edmonton and easily accessed by public transportation. The SAGE computer course was designed for older adults to attend on a voluntary basis. The City of Edmonton and the Edmonton Community Adult Learning Association provided funding for the course. Older adults paid a subsidized registration fee of $5 for the seven classes. Each course was three weeks in length, with one-hour classes three times a week; each in the early afternoon. Each course had a maximum of six people. Skills such as how to turn on a computer, use the mouse and keyboard, send emails, and use the Internet were taught by an instructor.

Research Study Purpose and Questions

The purpose of this pilot evaluation study was to explore and describe the perceived comfort level and intended usage of computers among older people who participated in the introductory computer course offered by SAGE. This study sought to answer two questions:

1. How do older people who have taken the SAGE computer course perceive the course's impact on their comfort level in using a computer?

2. What do older people who have taken the SAGE computer course perceive will be the course's ongoing impact on their computer usage?

Research Method

A non-experimental post-intervention survey design was used to answer the research questions. A single post intervention survey was considered the most feasible, given that it would be the least inconvenient for potential participants and thus potentially maximize voluntary participation. The paper survey tool was given to participants on the last day of each course so that participants could accurately recall their current post-course feelings associated with computer use. This pilot study was intended to potentially gain further insight regarding the sample population available at SAGE and to evaluate the appropriateness of this quantitative survey-based study design (Burns & Grove, 2011). In order to gain experience as a novice researcher, observation of the classes was included to gain insight about the course, the participants, the tool, and the design of the study.

A paper survey tool, adapted from Davis's online "Survey of Computer and Internet Use" (Davis, n.d.), was used to answer the two research questions. This survey tool contained 14 questions, eight of which compared older adult perceptions of computer use before and after the course. The questions sought information on the demographics of this population, their access to computers, their computer usage, and their comfort level before and after completing the course (Appendix). Prior to its use, a pilot test was done to ensure face validity regarding the appropriateness of the adapted questions on this survey using three individuals representative of community-dwelling older adults. These individuals were selected based on traits such as age and English-speaking ability expected to be similar to that of SAGE participants. The three individuals tested the appropriateness of questions and time required for completion. Feedback from the pilot group was used to make adjustments to the survey. Content validity was also assessed through a review of literature and consultation with my nursing supervisor.

The sample consisted of older adults who were, for the most part, independent adults with the ability to make their own decisions, manage personal affairs, and meet their personal needs without depending on assistance from another person (Baker, 2005). Inclusion criteria included participants who …:

1. were age 60 or older, as this age was representative of those who utilize services offered by SAGE.
2. had completed the entire three-week SAGE beginner computer course within the time frame of this study (May-August 2015).
3. were able to speak and understand English, the language used in the survey as well as the language in which the course was taught.
4. were willing and able to complete the paper survey.

Although there were no specific exclusion criteria, all persons who did not meet the above

criteria were excluded from the study. As such, the data for this study were obtained using convenience sampling, with only some of each class cohort completing the survey. The researcher worked with the SAGE computer instructor to advertise the study and to inform potential participants about the survey. A letter of information was given to participants at the beginning of the course. Near the end of the course, participants were reminded of the study in the following way: *"There is a U of A Bachelor of Nursing Honors student who is doing a study about older adults' perception of computer courses. She would like to invite you to complete a survey that will ask you about your comfort level and computer usage before and after completing the course. Being in the study and completing the survey is completely your decision. You do not have to do it and you can stop at any time. It should take approximately twenty minutes to complete the survey. I will hand out the surveys and it is up to you to complete them. I will collect them all at the end of the class."*

As indicated above, all potential participants were given the survey to complete on the last day of each course. Participation was voluntary and all survey responses were to be self-reported by each participant. Each potential participant could choose not to participate by returning a blank survey. Completed paper surveys (N=11 out of the 19 participants) were collected and the data entered into a spreadsheet for analysis using the SPSS (version 23) computer program. Descriptive and comparative analysis tests were used to answer the research questions, using tests appropriate for the level of data. The University of Alberta's Health Research Ethics Board approved this study prior to data collection.

Findings and Discussion of Findings

Overview of Course and Participants

The SAGE computer course was accessible to the older adults who took the course, both in terms of building location and price. The SAGE course computers were equipped with a standard keyboard, mouse, and headphones. The classes ranged in size from two to six persons. There was one instructor who taught the courses, who occasionally had the help of a volunteer. This instructor would often spend time with each participant individually, and provided more support to those who verbalized or appeared to be in greater need of assistance. A one-on-one style of peer supported teaching and learning is often helpful for older adults (Wang et al., 2011; Wood et al., 2010). The individual attention possible at the SAGE course allowed teaching to be tailored to each individual's learning pace and the overall needs of the participants. The participants were also encouraged to come early to class to get more individual help. The SAGE course was thus participant directed and oriented to their needs.

Of the seven classes in each course, four were structured and the last three were left for practicing skills taught in class or adapting skills to their own personal devices. The knowledge taught included understanding the basic parts of a computer such as the tower, the monitor, the keyboard, and the mouse. Participants were taught how to turn on the computer and log in using

the mouse and keyboard. A computer application allowed them to practice how to use a mouse. They then progressed to learning how to access the Internet and how to create their own email address or to access their existing email address and compose an email. Attendance was not mandatory; however, it was strongly encouraged.

Four courses were held over the study time period of May to August 2015, with 19 taking these courses. Eleven participants (58%) completed and returned surveys. The participants had a mean age of 72.7, with a range of 62 – 84 years. This age range suggests, in part, that older adults participate in courses such as this introductory course to engage in mentally stimulating activities after retirement (González, Ramírez, & Viadel, 2012).

Nine (81.8%) study participants were female. A larger female to male ratio is likely related to longer life expectancy of females versus males (González et al., 2012; Rosenthal, 2008).

Six (54.5%) individuals reported taking a computer course previously, and seven (63.6%) reported having a computer at home; with 10 (90.9%) individuals having some current access to a computer in their daily life.

The older adults used computers for a variety of activities. Surfing the Internet and sending emails were reported more often after having completed the course.

In assessing for changes in comfort levels after having completed the computer course as compared to their level before the course, only eight participants completed the before and after Likert-style rating questions. Four of the eight (50%) reported improved comfort while the other four reported no change in their comfort levels. A paired t-test determined no significant change in comfort levels (t= -2.049, df=7, p=0.080). A Chi square test (chi square = 2.778, df=4, p=.596) and non-parametric Spearman's rho correlation test (Spearman's rho=.418, p=.302) were conducted to further investigate comfort levels of older adults and both tests produced p values greater than an accepted value of 0.05, which indicates these results were not statistically significant. These non-significant findings are likely due to the small sample size and possibly also because half of the subjects were already comfortable with computers. In contrast, a similar pre and post intervention study by Wood et al. (2010) with a larger sample size of 64 older adults found an improvement in computer comfort, and particularly among male participants, whereas females in that study displayed little change in their comfort and usage of computers. Further inquiry is recommended to explore possible effects of gender on comfort and effectiveness of beginner computer courses.

In assessing the perceived impact of the course on their time using computers, five participants completed both the before and after questions. Of the five, three reported increased use times. The participants reported using the computer between 0 – 20 hours per week, with a mean time of 8.4 hours per week before completing the course. After completing the course, the range was to 3 – 30 hours per week, with a mean of 12.4 hours per week. A paired t-test, used to assess this change, indicated a non-significant finding (t=-1.312, df=4, p=0.260). However, it is

notable that most participants did report increased computer usage. This is not surprising, as older adults have previously reported using computers for a variety of reasons, with the most popular activities including sending emails and surfing the Internet (Wang et al., 2011).

The researcher's observation of the course and its participants provided additional relevant study information and insights. The older adults attending were culturally diverse with English not always their first language, although all were fairly fluent in English and appeared able to understand what was being taught. They reported varying amounts of family assistance in relation to using a computer at home. After completing the survey, many participants verbalized that SAGE volunteers were a valuable support in their use of technology, and some verbalized that they also had help from children and grandchildren with computer usage.

The participants often had some physical factors that could be barriers to their computer use, including eyesight limitations, reduced hearing, and reduced gross and fine motor abilities from arthritis of the fingers and hands. This observation was consistent with literature that cites physical limitations as barriers to technology use (Gitlow, 2013; Wang, et al., 2011). Several participants required the use of a walker, a reminder that some older adults are not able to access the SAGE building for computer courses. This could be an issue as some participants mentioned returning to take the course for a second or third time either because they failed to complete all the classes from a previous course or because they wanted additional practice with some skills. Many also verbalized that they felt the need to refresh their computer skills.

Conclusion

Although the comparative statistical tests were inconclusive, the descriptive data indicated an increase in the comfort level of approximately half of all older adults taking a short course on computers. Although this study was only a small pilot, it appears that older adults may benefit from classroom assistance to help them develop knowledge, skills, and confidence in using computers. The benefits of being "wired" are great for older adults, who are retired and at risk of being socially isolated and lacking cognitive stimulation.

There were two limitations to this study. First, the information collected was only retrospective and was limited by a brief survey tool. Second, the study participants had varying degrees of experience with technology; some participants had prior knowledge and skills before the course; some own a computer and some did not; some had assistance from family members and friends outside of the computer course offered at SAGE. Factors like these may have impacted their perceived comfort with computers. However, this study was effective as a pilot study in that it was able to provide some indication as to whether or not comfort levels and computer usage changed as a result of this course; and some areas to explore further in future studies were identified (Burns et al., 2011).

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Appendix A:
Survey for Evaluation of Computer Use Comfort Levels and Computer Usage by Older Adults

We would like to thank you for taking the time to complete this survey. Please answer the following questions below.

1. What is your gender?

____ Male ____ Female ____Other

2. What is your age?

_____

3. What is your highest level of education?

____Elementary School

____Junior High School

____Senior High School

____ Post-Secondary

4. Did you work with computers before the course?

____Yes ____No

a. If YES, please select activities performed from the list below:

____Browsing the Internet for personal entertainment.

____Use the internet for online banking and management of other personal accounts.

____Video calling or instant messaging through Skype, Facetime or other applications.

____Sending or receiving emails.

____Downloading and watching music or videos.

____Writing or creating a document in a word processor

____Excel spreadsheet entry and data analysis

____Using other applications on the computer. Eg. _____

____Other: _____

5. Have you taken a computer course before?

____Yes ____No

a. If YES then when? _____

b. If YES have you taken a previous computer course with SAGE?

____Yes ____No

If YES then when did you take it? _____

6. Are there people you know that help or can help you with using a computer?

____Yes ____No

a. If YES, who? _____

7. Do you have a computer at home?

____Yes ____No

a. If NO, do you have access to a computer elsewhere?

____Yes ____No

b. If you do have access to a computer elsewhere, where do you access it?

_____

8. How often did you use a computer BEFORE taking the SAGE computer course?

____Once a month or so

____Once a week

____Several times a week

____Once a day

____Several times a day

9. How many hours each WEEK did you use a computer BEFORE taking the SAGE computer course?

_____ hours a week

10. How often do you plan to use a computer AFTER the SAGE computer course?

____Once a month or so

____Once a week

____Several times a week

____Once a day

____Several times a day

11. How many hours each WEEK do you plan to use a computer AFTER the SAGE computer course?

_____ hours a week

12. What do you plan to use a computer for now that you have finished the course? Select all that apply:

____Browsing the Internet for personal entertainment.

____Use the internet for online banking and management of other personal accounts.

____Video calling or instant messaging through Skype, Facetime or other applications.

____Sending or receiving emails.

____Downloading and watching music or videos.

____Writing or creating a document in a word processor

____Excel spreadsheet entry and data analysis

____Using other applications on the computer. Eg. _____

____Other: _____

13. Please select one of the options after reading this statement: I felt comfortable using a computer BEFORE starting the SAGE computer course.

____Strongly disagree

____Disagree

____Neutral

____Agree

____Strongly agree

14. Please select one of the options after reading this statement: I feel comfortable using a computer now AFTER having completed the SAGE computer course.

____Strongly disagree

____Disagree

____Neutral

____Agree

____Strongly agree