

Exploring the use of Technology for Active Aging and Thriving

Tone ØDERUD^{a,1}, Elisabeth ØSTENSEN^b, Edith Roth GJEVJON^{b, c}, Anne MOEN^b

^a*SINTEF Technology and Society, Oslo, Norway*

^b*University of Oslo, Faculty of Medicine, Department of Nursing Science, Norway*

^c*Lovisenberg Diaconal University College, Norway*

Abstract. The study explores how older adults with limited digital experience become users of tablet computers (iPad) with Internet access, and how the tablet computers become part of their daily life facilitating active aging and thriving. Volunteer adolescents were mobilised to teach and follow up the participants regularly.

Keywords. Active aging, information technology, volunteer adolescent, qualitative research,

1. Introduction

Over the last 20 years information and communication technology (ICT) has become an integral part of people's everyday life. Nevertheless, elderly people's adaptation of technology lags behind younger age groups [1], and it is likely that lack of familiarity with new ICT tools is a main cause.

ICT generates new opportunities to explore areas of interest and stay in contact with others on an everyday basis. It is claimed that technology facilitates independence, autonomy and social participation [2]. These are important ingredients in "active aging" [3]. Declining social networks, less social contact and fewer opportunities for participation may accelerate processes of decline, and lead to failure to thrive among the elderly [4]. Thriving can be seen as subjective experiences of meaningfulness, wellbeing, and experienced quality of life.

However, lack of familiarity, poor user skills and low digital literacy increase the likelihood of falling behind and becoming dependent on others [5]. Furthermore, older adults are unlikely to start using the Internet or tablet computers without some form of assistance [6]. In sum, the lack of skills, lack of sufficient assistance and ongoing declines might in turn lead to reduced participation and thrive.

The purpose of this article is to present how introducing new technology like tablet computers and mobilising volunteer services can increase older adults' participation and thriving. Data from the intervention has previously been analysed and presented with respect to an emerging innovative care model that supports participation and thriving by older adults in residential care [7].

¹ Corresponding Author. Tone Øderud, SINTEF Technology and society

2. Methods

2.1. Qualitative Research Design

The paper reports on empirical findings from a longitudinal study. A qualitative research design was considered most appropriate providing in depth information and detailed understanding of how older people experience using tablet computers as part of their daily life. The study had an exploratory design [8], studying an intervention with tablet computers for older adults in long-term residential care in two, urban municipalities in Eastern Norway (hereafter referred to as Municipality A and Municipality B). The duration of the intervention was one year (2013-2014).

The inclusion criteria were older adults with little prior knowledge of tablet computers, living in a private, supported, senior apartment (n = 3) or residential care facility (RCF) (n = 12). Older adults diagnosed with cognitive impairment and significantly, reduced eyesight were excluded. Staff and leaders in the healthcare section of the municipalities carried out recruitment of participants. In Municipality A, participants were recruited through a rehabilitation program. In Municipality B, the head nurse at the RCF recruited participants. Table 1 shows the demographics of the participants.

Table 1. Participants Demographics (n=15)

Characteristics	Column2	Column3
Age (years):	Mean: 78.3	Range: 54-94
Type of residence:	Residential care facility: 12	Private home: 3
Computer experience:	Yes: 5	No: 10
Participated in workshops:	No: 3	Yes: 12
Gender:	Male: 6	Female: 9

2.2. Description of the Intervention

The participating older adults were given an Internet connected tablet computer (iPad with 3G or Wi-Fi connection), free of charge, to use as they liked. The iPad was set up with an individual user account, including e-mail, Apple-ID, Skype-ID, passwords, and codes. This information was provided in writing to each participant. To avoid overwhelming the participants, a carefully selected, smaller set of basic applications (apps) were installed when the intervention started. These apps were: Skype, a selection of digital Newspapers, Google, and a food recipe app. Additionally, one or two individual apps reflecting the interest of the participants' were installed.

Volunteer adolescents were recruited to train and follow up the participants regularly. In Municipality A, the volunteers were 16-year-old high school pupils, specialising in health and social care. They had a structured plan for the training workshops, and the tutoring was individually adjusted. In Municipality B, the volunteers were recruited from an after school youth club. They were between 12 and 16 years of age. The tutoring was individually adjusted to the participants, but had a looser structure. The volunteers were given a list of possible subjects to focus on, in addition to follow the participants' interests and wishes. The young volunteers met with the participants for a one hour training workshop once a week for one year. During the

intervention, the group of volunteers was replaced once in Municipality A and twice in Municipality B, due to natural changes.

2.3. Data Collection

Data were collected from semi-structured individual interviews with the participants, from informal talks with the volunteers, and from observations of the participants and the volunteers during training workshops. Additionally, semi-structured interviews of four nurses, knowing the participants in Municipality B, were conducted.

The researchers regularly observed the participants during the weekly training workshops together with the young volunteer. Field notes were taken describing how the participants used the tablet computer, their general progress, and the interaction between participants and young volunteers. The group in Municipality A was observed in 16 out of 22 workshops, and the group in Municipality B was observed in 6 out of 26 workshops.

Individual semi-structured interviews were conducted by two of the researchers at baseline, after 6-8 weeks and after 12 months at the end of the intervention. An interview guide was developed to capture data reflecting the focus of the intervention: (a) experience with ICT, (b) activities and interests, and (c) social network and social interaction.

The interviews were audio-taped, and later transcribed. Field notes taken during the interview were summarised directly afterwards. The participants chose whether they wanted the interview conducted in their own apartment or in a meeting room at the RCF. One of the participants had a family member present at the interview.

2.4. Data Analysis

Inductive and deductive approaches were combined to analyse the empirical material [9]. The transcribed interview data were first screened inductively and were subjected to a broad selection of material according to relevance to the focus of the intervention: activity, social contact, communication, or technology.

Selected data were subjected to a thematic analysis using the analysis tool NVivo version 10 (QSR International, Burlington, MA, USA). Four researchers (i.e., authors) read the transcripts (n = 37). Open coding, assigning initial codes during first examination and exploration of the data were used. The properties of each code were discussed and agreed upon. Field notes supplemented interview data and were analysed to further understand the processes that led digitally naive people in residential long-term care to include an iPad in their daily life.

2.5. Ethical Considerations

The Norwegian Social Science Data Services approved the study's protocol (project number 31531/2012). In addition, the participating municipalities approved the study. All participants gave informed, written consent prior to interviews, and approved audio recording. Privacy was maintained by removing names and identifiable information from transcripts prior to any analysis. The young volunteers in Municipality A gave their informed consent to participate, and in Municipality B written permission from parents were also obtained, since the volunteers young age required co-signing by their guardian.

2.6. Limitations

Limitations to the study include a relatively small sample of participants and the study's exploratory nature. More studies are needed in order to identify if similar results could be found in other settings with a different sample of older adults. Although there are limitations, it strengthens the study that the intervention was carried out in two different municipalities, with different degrees of structure, hence suggesting that results are valid across settings. In addition, the study was longitudinal, with repeated meetings and continuous follow-up over the course of a year, which strengthens the trustworthiness of the results. Low attrition also supports the claim that the older adults found the intervention interesting over a long period of time.

3. Results

The study focused on each participant's individual process during the intervention to elicit more insights regarding interest, ability, and frequency in use of ICT.

3.1. Sense of Accomplishment, Confidence and Thriving

Initially, many participants had doubts about their ability to use an iPad, but motivation from relatives and caregivers had convinced them to try. One male participant explained that his son encouraged him to try and, one female participant shared how doubt had changed into confidence after some time, much to her appreciation:

"To be honest, I didn't think I would be able to use it [the iPad], but now I can do it. I thought I was too old to learn something that I had never seen before. I thought I could not make it being almost 100 years old, but now I can and it is great fun!"

The participants expressed pride as they acquired basic skills to operate the iPad. The caregivers described a change in social behaviour for many of the participants using iPads; they took more initiative, were more socially active, showed more self-confidence, and were proud of their new skill. Being able to use an iPad with Internet facilitated social participation and thriving, regardless of level of performance.

3.2. Staying Informed and Feeling Included in Society

The young volunteers guided the participants to expand their use of apps reflecting their interests, often for entertainment purposes or as a source of information. A female participant in her nineties, living alone and spending much time by herself, said:

"I use it [the iPad] every day. It's the first thing I do when I get up in the morning. I look at the headlines in the newspapers, and afterwards I sit with it [for a while]. Sometimes I'm thinking "Oh, my goodness it's dinnertime!" There's so much to look at, so I think having it [the iPad] is very entertaining."

Some were happy staying with the initially selected apps and did not explore or look for more possibilities. Others tried additional apps. The apps for weather forecasting caught much interest. A male participant explained how he could keep himself updated on the weather forecast at different interesting locations:

"I follow the forecast for three to four locations: the village where I was born, for Telemark [another county], my current place of living, and for Karasjok, that very cold place."

Some also enjoyed following the weather abroad, where their relatives lived or grandchildren studied. Being updated on the weather is an example of how the possibilities of the iPad spiked curiosity and expanded perspective. Being able to independently manage apps fostered continuation in the study. All participants were reading newspapers on the iPad, and expressing an interest to stay informed about major events and news from a local and a global perspective. To have electronic access to different newspaper and read news on the iPad before it was published on television or on paper was highly appreciated. The participants reported that they enjoyed themselves and felt more informed. One female participant aged 94 proudly said:

"It is great fun, and I feel very much up to date on what's going on."

Some participants sought out more apps. Several of the male participants shared an interest in music. On the iPad they started exploring music apps such as Spotify and YouTube. They found and listened to music every day or enjoyed watching music videos from a wide range of decades and genres. One of them expressed his enjoyment of using YouTube:

"I listen to a lot of music. I also use this YouTube and I enjoy listening and watching the music videos. I love Elvis. He is the best, I believe!"

Another explored and expanded his interest for classical music through YouTube by listening to how different artists, conductors, and orchestras performed masterpieces from the old classic composers.

"I played the music with different sopranos singing and different orchestras and conductors. I was sitting for more than an hour listening to the same piece of music, but in different versions and artists."

This participant gained new interests seeking knowledge about music. He started reading more about the history of the composers, and this triggered his interest in searching for information about other famous persons on the Internet. He explained:

"I was recommended to seek information by using Google, and I did so. It is very interesting and I am now using the Internet as a reference book."

Participants explored according to their interests and gained new knowledge by the possibilities delivered by the Internet and the iPad.

3.3. Social Contact and Participation

While some used the iPad solely for entertainment purposes, others sought and tried to re-establish contact with relatives and friends. They tried communication apps like messaging, video conversation, and e-mail. Most of the participants communicated regularly with close relatives and friends, and a few reconnected with old friends from their period of study.

Although participants preferred face-to-face communication, online communication came as a supplement when that was not possible. A male participant explained that he preferred the usual visits from his children and grandchildren, but he enjoyed receiving photos electronically when the family visited their holiday cottage in the mountain. A female participants had similar experiences and explained:

"It is about my children and grandchildren. I didn't see the need for e-mail or other type of online communication, but when they are on holiday or travelling, then I can feel the need for e-mail communication, and I send them an e-mail."

One female participant had not been able to travel and visit her relatives for more than two decades due to illness. By using her iPad, she could communicate with her family and friends using Skype, e-mail, and Facebook:

"I receive photos from my sister's daughter and her children. It is very nice for me to see her children and grandchildren. I can see their new cozy home that they just bought, in the area of my hometown. I can see my brother's children, and they are all sending me messages. And my cousins, I can see them all being together at my childhood home. For me, this is incredibly nice to see."

Although her health condition restricted her to travel to visit her family and attend family gatherings, she could stay in touch, feel included and enjoy participation using the iPad. To her, access to social media opened up a completely new world where she could stay in touch with family and friends when her health condition permitted her to do so. From being almost totally isolated, she became a more active participant in the lives of her family.

3.4. Bridging the Gap between Generations

The regular follow-up from young volunteers for encouragement, validation and problem solving, were invaluable. Much of the achievements were attributed to the individualised follow-up, motivation and collaboration across generations. The volunteers explained that they enjoyed teaching the older adults. After one of the follow-up sessions, a female volunteer expressed her satisfaction: *"Being here makes me happy"*.

Furthermore, the young volunteers experienced that they needed to be patient, and let the elderly try by themselves. One young male volunteer explained:

"We have to take it slowly and be patient." While an elderly male participant explained how he perceived the situation:

"Our vision is reduced, we are hard of hearing, we easily forget and we are slower than before, but the youth are great and they help us a lot. It is very nice."

Both the young volunteers and the older adult participants agreed that it was important for the participants to try themselves at their own pace, while the young volunteers could assist, when needed. The elderly made sure that they joined the regular training and they appreciated the time spent with the young volunteer. In Municipality B, the youth club was located next to the RCF, and the volunteers from the youth club invited the elderly to join them for watching a video at the youth club. They also suggested to prepare food together and have a social afternoon, bridging the gap between generations.

4. Discussion

A strategy to maintain social, physical, or mental well-being can be to take advantage of opportunities to participate in society, and providing means to maintain social relationships can contribute to independence and autonomy [10, 11]. The study was seeking out opportunities for participation and thriving by introducing older adults to tablet computers. The results showed that the participants learned and became more skilled tablet users [7]. The discussion focuses on driving factors for expanded technology use, regular follow-up with a person-centered approach, and promotion of active aging. During the 1-year intervention, some driving factors seemed pivotal for the participants' ability to use the iPad for different purposes. As expected, individual

follow-up of the participants by young volunteers helped accommodate different interests, concerns, needs, and burning questions and were necessary for most participants [12]. The participants used the iPad to seek information and entertainment, to increase social contact, for exploration, or to make transactions. They could choose pace, type of activity, extent of use, and apps of interest individually.

This is well in line with previous reports that interest and ability to learn how to use new tools, also among older adults, reflects perceived usefulness [7, 12, 13]. When gaining familiarity with technology, older adults tend to include Internet use as a routine part of their everyday life [6]. An important dimension of the intervention was the scheduled, regular opportunities for follow-up that provided predictability, stability, and regularity to when support was available. Attending to the participants' specific questions, contributing to ad hoc problem solving, or showing how an interest could be pursued, encouraged use of the iPad and learning, well in line with suggestions on how to advocate for older adults' learning [14].

Apps with potentials for new forms of participation were selected, such as Skype and local newspapers, anticipating that the participants would enjoy these opportunities. Apps like the weather app or YouTube, motivated and expanded perspective. How the older adults used the iPad and chose to interact with the volunteers represented complementary approaches to increased societal participation. The basic introduction, access to individual follow-up, and prescheduled, regular workshops were offered to all participants. The possibility to pursue their individual interests from the beginning gave the participants an additional incentive for use. This approach also eased acceptance and confidence to use new ICT tools [15], and it is referred to as an important dimension when introducing tablets to older adults.

Intergenerational collaboration is suggested as a promising, innovative strategy [16]. Regular meetings with the young volunteers provided additional motivation to use the iPad, explore, and practice, and played an important part in the intervention. This arrangement may have prevented attrition among the participants, which is often reported as a problem in previous studies [17]. Joy and excitement was observed amongst the participants, especially when they found information, added apps, or mastered new things using the iPad. The young volunteers helped them, explained, and engaged patiently. The iPad was seen as a shared interest serving as a bridge across generations. The importance of intergenerational meetings should not be underestimated, and the regularity of meetings provided predictable opportunities to meet. Based on findings, it is suggested that an interplay of (a) apps of interest on the iPad (i.e., simplified tools); (b) predictability, personalised pace, supporting the person's interests, and access to a tutor for the participant (i.e., person-centered process); and (c) engaged young volunteers from the community is fundamental. This interplay augments the process as driving forces to enable use of the tablet for participation among older adults, encouraging thriving and social contact. Furthermore, it is acknowledged that these dimensions may contribute differently, and their relative importance could be investigated in later studies. The study supports the idea that easily available technology such as tablet computers are promising tools for promoting health and well-being. Tablet computers may increase activity and engagement and prevent failure to thrive in older adults.

5. Conclusions

The study has provided knowledge on how the participants may overcome barriers to digital inclusion and how technology like tablet computers may contribute to active aging, participation and thriving among older adults. Following the person-centered introduction, regular teaching and follow up by young volunteers, the participants expressed confidence and enjoyment when using the iPad with different apps. By supporting personal interests, individual focus and tempo in the introduction, and finding apps that triggered curiosity, enjoyment and social participation, the participants' expressed pleasure and thriving. Interaction between young volunteers and older adults were invaluable and contributed to bridging the gap between generations.

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