What Motivates Older Adults to Learn to Use Mobile Phones

Charlotte Tang, Rock Leung, Shathel Haddad and Joanna McGrenere
Department of Computer Science, University of British Columbia
scctang/rockl/shathel/joanna@cs.ubc.ca

ABSTRACT

Older adults have been relatively slow to adopt mobile phones and services. This may be due to their perceived limited needs for using mobile phones resulting in low motivation, and also to the learning difficulties they encounter. We present a field study with six participants that employed mixed qualitative methods: longitudinal contextual interviews, a semi-structured event-driven journal, and phone interviews, to investigate how older adults learn to use a feature-rich mobile phone. Trial-and-error and the device's instruction manual were evenly preferred by participants to learn to use the Smartphone provided in the study. We identify several factors that could (de)motivate their learning. Offering a simple task list, for example, surprisingly provided substantial motivation. Older adults who were highly motivated to learn were generally found to experience more successes and higher satisfaction in their learning outcomes.

Author Keywords

Motivation, mobile phone, older adults, learning resources.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Human Factors.

INTRODUCTION AND BACKGROUND

Older adults (aged 60+) have been relatively slow to adopt mobile phones and services [11,15] despite their potential benefits. Mobile phones can help maintain older adults' quality of life, for example, by keeping them connected with loved ones, maintaining contact information, and providing reminders about important events. While a small number of studies have looked at how older users go about learning to use mobile phones and the barriers to learning, to our knowledge none have studied how older adults initially learn, in the comfort of their homes, to use a Smartphone, which combines the functionality of a personal digital assistant with a mobile phone.

The low adoption of mobile phones by older users may be due, in part, to the learning difficulties they encounter. These difficulties have been attributed to their general lack of experience with computers and mobile devices [4] and poor usability of mobile phones, such as complex interface design and small button size [7]. Another potential barrier to mobile phone adoption is perceived utility. One study showed that older adults used mobile phones for very limited purposes, such as calling or texting in emergencies only [8]. Their perceived limited needs for using mobile

phones may have contributed to their reduced desire to learn advanced features in that study.

Yet, mobile phones have been perceived to have a positive impact on personal independence [1] and self-image [12]. Safety and security have also been recognized as the most important reasons for motivating mobile phone adoption among older people [10]. Thus mobile phones' perceived usefulness, and the users' self-actualization and enjoyment were regarded as important factors for motivating older adults to use mobile phones [3].

Further, the findings regarding older adults' preferences for different learning methods have been mixed. Leung's survey study showed that the manual was the preferred learning resource [9]. Kurniawan's focus group and laboratory observation study, by contrast, showed that the manual was only consulted after using trial-and-error [6].

We set out to undertake a more naturalistic approach to investigating how older adults learn to use a Smartphone. Specifically our participants had the opportunity to learn, explore and use a feature-rich Smartphone for 7 to 10 days in their habitual learning environment, which was in most cases their home. Our study design was structured to capture different components of their learning experience including the resources used and the difficulties encountered. However, as the study was taking place, a salient and interesting phenomenon emerged unexpectedly. Conversations during the contextual interviews and phone interviews often naturally delved into issues regarding their motivation to learn a Smartphone and its features. Therefore this paper focuses on the factors that can (de)motivate older adults to learn to use mobile phones. Offering a simple task list containing key features, for example, was surprisingly a great motivator.

METHODOLOGY

We conducted a field study using triangulated methods. Data were collected during field visits through note taking (about 30 handwritten pages) and video recording (about 10 hours, transcribed). Phone interviews were documented. A total of 37 "Eureka" reports (Fig. 1), and participants' notes (Fig. 2) that they made during the study week were collected. Emerging themes were identified and iteratively refined during data analysis.

Participants. Participants were six older adults (two males – P5, P6), aged between 57 and 76 (mean age 65.8), free from cognitive impairment and motor impairment in their hands. All our participants had been using a mobile phone for at least a year – five used a "regular" mobile phone while P6 used a Smartphone. None had a data plan. All the
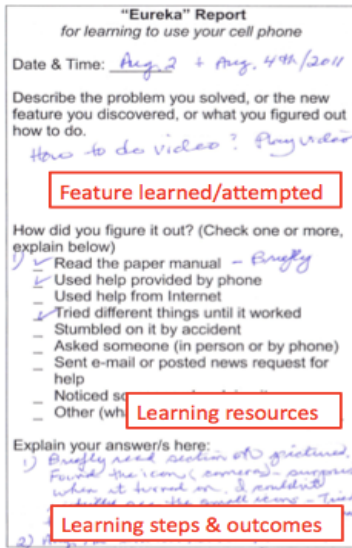
Fig. 1: "Eureka" report in a learning journal.

participants had college or higher education except one with Grade 10 education. Two participants lived alone, three with a spouse only, and one with a spouse and two daughters. They were recruited through snowball sampling and posters placed in community centers and libraries in an urban city in North America.

Methods. For each participant, we conducted two field visits (approximately 1.5 hours for the first visit and 45 minutes for the second, 7 to 10 days apart) and two phone interviews (each about 15 minutes, between the two visits). The field visits were conducted in a place where our participants normally learned to use new technologies; we met with all our participants in their home except P1 who chose to meet in a local community center.

In the **first visit** we asked participants about the resources and methods that they had used for learning to use their own mobile phone and the features that they had explored. We also asked them to demonstrate those features. We then introduced the *study phone*: an Android HTC Google Nexus One [5]. An Android phone was chosen because this type of Smartphone is the most popular overall (48% of market share) and also the most popular for first-time buyers (57% of market share) [17]. We explained to each participant the touch screen interactions, key icons, physical buttons, and phone accessories. The study phone was equipped with a pre-paid phone plan that included voice calls, text messaging, and data. The goal was to provide a feature-rich phone for the participants to explore as they pleased. Next, we gave them a paper manual (300+ pages) and a 2-page list of suggested tasks (Fig. 3) for the study phone. The manual was a printout of the official online manual as the study phone did not come with a paper manual by default. We provided participants with the manual as an optional resource. We also offered them a digital copy of the manual which only one participant accepted. The task list displayed names (without instructions) of 11 commonly used features such as phone calls, contacts, text messaging, email, camera, and Internet. Our intention of including the task list was to provide a quick reminder of possible features to explore, especially for those who are not familiar with Smartphone capabilities. Finally, we explained the learning journal, a booklet made up of "Eureka" reports adapted from [13]. Participants were asked to fill in a Eureka report every time they discovered a new feature or encountered a learning problem along with details of the resources they used (Fig. 1). During the **phone interviews**, we asked participants about the features they had explored and how they had learned to use those features. In the **second visit**, we probed deeper into the participants' learning experiences and inquired about the methods and resources they actually used during the study, using the learning journal as a conversation prop.

FINDINGS

We present the learning resources and methods used by our participants for learning to use a mobile phone, followed by factors that played a role in (de)motivating their learning.

Learning Resources and Methods

All the participants (except P1 who only used trial-and-error) used a combination of resources and methods for learning the study phone.

The most preferred learning method among our participants split between *trial-and-error*, as found in [14], and *paper manual,* as found in [9]. For example, P6 stated, "*everything is trial-and-error…99% of how I learnt was trial-and-error*" whereas P4 and P5 referred to the manual extensively, in contrast to the others who only scanned selected task instructions that they wanted to learn.

Participants who preferred trial-and-error emphasized the importance of a simple phone design with clear **on-phone instructions**. Some participants also enjoyed the element of serendipity associated with trial-and-error such that it often led them to stumble upon new discoveries as they were trying things out. For example, P3 was excited to discover by chance the pinching gesture for reducing text size on the screen. We observed P2 and P4 *taking notes* as we were explaining the basic features of the study phone (Fig. 2). They reported that they referred to these notes and made more notes as they continued to learn on their own.

Our participants generally did not choose to learn from their *social circle*. However, we found an interesting contrast between two of our participants' attitudes regarding learning with others. When we asked P2 why she did not ask her tech-savvy husband for help with the Study phone during the study week, she responded, "*If I ask him, we will start World War III.*" In contrast, P6 enjoyed engaging his wife in co-learning, justifying that "*…two brains are better than one*" (P6). The couple would sit together, exchange control of the study phone and try things out as a team.
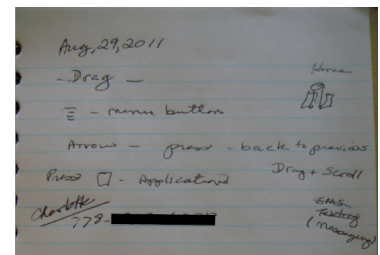

Fig. 2: Notes taken while learning to use the Android phone.

Motivation Impacts Learning

We found participants fell into two groups that exhibited dramatic differences in their desire to learn the study phone. P3, P4, and P6 displayed a *high* level of motivation to learn (HM), whereas P1, P2 and P5 showed considerably *lower* motivation (LM). However, with our small sample size, we do not intend to classify them into the two concrete groups. We only use these group labels when behaviors were common to all members of the group.

Consistent with previous work, the LM group were found to spend relatively less time than the HM group using the study phone, experimented with fewer features, and did so on a more superficial level. All three LM participants also expressed frustration in their learning experience with the study phone. "*I feel bad about saying this, but I won't want this phone to waste a percentage of my trash!*" (P1). "*As always, learning a new machine is nerve wrecking and frustrating…I am not one for perseverance*" (P2). "*I want to throw [the phone] to the wall!*" (P5).

We identified several factors that appeared to impact older adults' learning, particularly their motivation to learn to use a mobile phone. These factors were identified from the participants' collective learning experiences from both the study phone and their own mobile phone.

Goal setting. Much to our surprise, all participants found the task list that we provided very motivating in their learning process with the study phone. Participants used the task list as a source of concrete examples of tasks they could attempt to learn. For instance, P5 said he went over the list, decided what he wanted to learn, and then proceeded to the manual to learn them. Other participants also used that list as a guide for what they could accomplish on the phone. Some also used it to track their progress and for note taking (Fig. 3). P6 said "*I like that [task list]! Things to try…that's excellent! That should come with other phones, because otherwise you just don't know…I mean there's lots of apps here*". We had not expected that a simple task list like the one we used in the study could have such dramatic impact on older adults – stimulating them to set goals for themselves, which in turn motivated them to
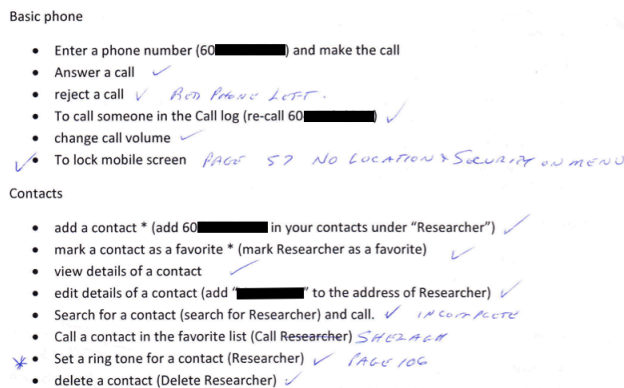

Fig. 3: A snapshot of the task list showing the first two features to explore, and also a participant's progress annotations and notes.

learn and explore new features on the study phone. This finding echoes the motivation theories for learning that setting challenging yet attainable goals can be an important source of motivation [16]. We thus envisage that the task list provided a roadmap for participants to learn to use the study phone.

Perceived needs. Participants' motivation to learn to use a mobile phone also seemed to be positively related to their perceived needs for using a mobile phone. The LM group expressed very limited needs for using their own mobile phone. P1 and P5 used their own mobile phone for calling and storing contacts only. P2's needs were limited to dialing numbers (i.e. not using contact list) and receiving calls. These limited needs seemed to subdue their motivation to learn to use the study phone as exemplified by P2's comment: "*Perhaps if I had a stronger desire or need to use this [study] phone, I would be prepared to go to greater lengths to learn*". Conversely, the HM members indicated that they used their own mobile phone for a variety of purposes such as its address book, camera, alarm clock, calculator, and measurement converter. This behavior was also evident in their learning the study phone such that they were much more enthusiastic in exploring the capabilities of the study phone and they ventured further and deeper into various Android features.

Exposure to technology. Participants' motivation for learning to use a mobile phone seemed to be influenced by their general familiarity and engagement with technology. The LM group seemed to be less exposed to technology than the HM group. P2 and P5 both relied on their tech-savvy spouses for technology-related issues in the home, and hence did not have to deal with technological gadgets themselves. In the HM group, P6 was in charge of all the technological devices in the home, and P3 was generally comfortable with technologies, explaining that 75% of what she managed to learn on the study phone was a result of knowledge transfer from her experience with other devices.

Social influence. Participants' social circle appeared to influence their motivation to learn to use features on their own mobile phone. None of P2's friends used text messaging so she found no reason to learn it. Similarly P4 who had used text messaging when she first got her own mobile phone had stopped using this feature after realizing that her friends did not use it. The participants expressed that they would be motivated to learn to use other features if they could use them with their friends.

Experience with learning resources. Participants' experience with learning resources may have also impacted their motivation to learn to use a mobile phone. In particular, while there exists a number of guidelines for improving the design of training materials including manuals (e.g., [2,4]), both P2 and P5 found "*a mismatch between what's in the instructions [manual] and what's happening on the phone*" (P2); specifically, they often found the instructions in the manual to be incorrect, and that discouraged them from exploring further. Moreover,

the 300+ pages of the manual made the participants feel "*daunted*" (P2) and "*overwhelmed*" (P6), and several participants found many of the instructions too complex and lacked detail. Several participants resented the language used in the manual. For example, P2 found it "*a great deal of verbiage*" and P4 referred to the technical language as "*jargonese*" with negative sentiment. Yet, despite the use of "foreign" language in the manual, P4 became very motivated and delved into exploring the Android features when she was able to perform tasks by following instructions. P4 also told us two previous experiences she had had with another learning resource: once she got very discouraged by an in-store help agent's condescending attitude, while another time she became highly motivated to learn to use advanced mobile phone features when a different help agent was respectful and courteous.

DISCUSSION AND FUTURE WORK

While a minimal manual [2] might be more effective than a full manual, our study indicated that providing a further "minimal" task list may also be valuable for learning. Such a list unexpectedly motivated older adults to learn in our study because it provided them with a set of clear goals. However, it remains an open question as to how minimal a task list would need to be in order to achieve a desirable level of motivation in older adults. Other questions include if and how this kind of task list would impact the learning experience of other age groups. We must also recognize that the participants may have been motivated, thus behaved, differently because of the Hawthorn effect, despite being in their own natural environment.

Although the mobile phones owned by our participants were not as feature-rich as the Android phone used in the study, most had a variety of features such as a camera, video, email, and browser. Yet participants reported that those features were less usable and flexible compared to the ones on the study phone due to issues like small screen size, non-adjustable font, and text web browsing only. As a result, most of our participants only used their own mobile phone for basic functionality such as making calls. Another reason for not exploring beyond basic features was the lack of knowledge about what services were included in the mobile service plan. As a result, participants felt reluctant to explore freely for fear of incurring unexpected charges on their phone bill. To remedy this, a task list similar to what is described above but also showing the set of features covered by the participants' phone plan could be useful. Participants could then be worry-free when exploring features in the task list. On the other hand, the opportunity to fully explore the feature-rich Android phone during our study made many participants realize the breadth and depth of functionality that a modern mobile phone can provide. As a result, they expressed that they had acquired a better understanding of modern technologies, specifically smartphones.

While it is important to improve mobile phone interfaces [6,7] and the accompanying learning resources [9], this study provided insight into the importance of studying how older adults are motivated so that they can achieve a successful and enjoyable learning experience. Lastly, we recommend that there be further research, involving a greater number of participants, in order to further clarify the relationship between motivation and learning outcomes, and to investigate how the motivational factors may be manipulated to increase older adults' desire to learn to use mobile phones, and mobile devices more generally.

REFERENCES

1. Abascal, J., Civit, A. Universal access to mobile telephony as a way to enhance the autonomy of elderly people. WUAUC 2001, 93-99.
2. Carroll, J., Smith-Kerker, P., Ford, J., and Mazur-Rimetz, S. The Minimal Manual. Human-Computer Interaction 1987, 3(2):123-153.
3. Conci, M., Pianesi, F. and Zancanaro, M. Useful, social and enjoyable: mobile phone adoption by older people. Proc. INTERACT 2009, 63-76.
4. Fisk, A.D., Rogers, W.A., Charness, N., Czaja, S.J. and Sharit, J. Designing for older adults: principles and creative human factors approaches, 2nd Ed. CRC Press, 2009.
5. Google. Nexus One user guide, 2010.
6. Kurniawan, S. An exploratory study of how older women use mobile phones. Proc. Ubicomp, 2006, 105-122.
7. Kurniawan, S. Older people and mobile phones: a multi-method investigation. International Journal of Human-Computer Studies 2008, 66:889-901.
8. Laughlin, Z. Mobile phone users: a small-scale observational study 2001 http://www.aber.ac.uk/media/Students/zgl9901.html
9. Leung, R. Improving the learnability of mobile devices for older adults. PhD thesis, University of British Columbia, 2011.
10. NTT DoCoMo. Mobile phones increasingly popular among the elderly. Press Release 34(11).
11. Ofcom. Media literacy audit - digital lifestyles: adults aged 60 and over. Media, 2009.
12. Oksman, V. Young people and seniors in Finnish 'Mobile Information Society'. Journal of Interactive Media in Education 2, 2006.
13. Rieman, J. A field study of exploratory learning strategies. ACM TOCHI 1996, 3(3):189-218.
14. Selwyn, N., Gorard, S., Furlong, J., and Madden, L. Older adults' use of information and communications technology in everyday life. Ageing and Society 2003, 23(5):561-582.
15. Smith, A. Mobile Access 2010, Pew Internet, 2010.
16. Svinicki, M. New directions in learning and motivation. New directions for teaching and learning 1999, 80:5-27.
17. Android Community. http://androidcommunity.com/android-most-popular-among-first-time-buyers-in-q4-says-npd-20120206. Retrieved Feb 7, 2012.