ASSISTING WELLBEING

The Challenges of using Technology to Improve Wellbeing in Older Adults

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Abstract: Telecare is an increasingly important application of technology that is designed to increase the independence of older adults, amongst other goals. The programme of research described below aims to identify important issues with the deployment of this technology to the target group. It describes an on-going programme of research that attempts to classify these issues, and posit solutions. It additionally proposes a new area of research into the effects of telecare and related technologies on a client's psychosocial wellbeing.

1 INTRODUCTION

The UK Government has a published plan to provide Telecare into every home that requires it by 2010 (Curry, Trejo-Tinoco, & Wardle, 2002). One of the problems faced in requirements gathering and analysis in the assistive technology (AT) field is the number of stakeholders involved. These parties include healthcare providers, social services, formal and informal carers. The needs of these groups have been studied (e.g., Lines & Hone, 2004). However, few studies have tried to gather older adults requirements and aspirations.

It is argued that the shift towards using technology to provide or even replace services that promote client independence should be accompanied by a focus on addressing more holistic needs, such as improving well being and quality of life. The purpose of the current research programme is therefore threefold:

1. Telecare is an emerging and increasingly important aspect of AT (Barlow, Bayer, & Curry, 2003). However, although there is evidence to support the view that telecare can assist in ensuring the physical well being of clients, there has been little research around the effect of such systems on the psychosocial aspects of wellbeing. Aim 1 is therefore to test the effect of contemporary system provisions on the psychosocial well being of older adults In order to achieve this aim the authors have created a system that provides similar outputs to those of other commercial offerings in the telecare arena.

2. It is hypothesised that telecare systems will have a greater effect on the psychological well being of users if users are provided with increased feedback on the information that these systems can provide. To this end the prototype system discussed above is provided with a user interface that is capable of providing continual feedback on the status of the system, and by inference the status of the client's home. The second aim is to investigate if the provision of an easily accessible user interface will improve on the effects measured above

3. The third aim of this programme is to identify the needs of older adults with respect to future developments, direction, and provision of an Enhanced Electronic Assistive Technology System (EEATS). Research (Dickinson, Eisma, & Gregor, 2003) indicates that the increasingly (over)complex user interfaces associated with modern computer applications (and systems) places a large burden on a users cognitive abilities as they try to build a mental model of the operation of the system and

this, combined with lower confidence makes it difficult to master new technologies (Marquie, Jourdan-Boddaert, & Huet, 2002). Training alone will not increase confidence (Segrist, 2004), and as anxiety about using computers is positively associated with age (Ellis & Allaire, 1999) it may be that pursuing the use of computers specifically needs revision, and technologies, such as the telephone (Reed & Monk, 2004), or other familiar technologies need to be revisited as viable alternatives. White et al (White et al., 2002) recognised that a simplified interface would be of benefit to older adults. The first stage of the present study therefore sought to identify the current trends in IT and AT use in older adults, with a view to establishing the ideal mode of delivery for AT in the proposed intervention.

2 METHOD

2.1 Design

There are three stages to the present study.

Stage 1: The aim was to gauge established practice with IT, AT and familiarity with household technology using a postal survey.

Stage 2: The aim is to explore the effect of AT on mental health well being and to elicit an evaluation of the system provided. Measures of psychological functioning, quality of life, relationships with others, and well being, will be taken before and after a trial period of one week using the AT.

Stage 3: The aim is to explore possibilities for the type of applications older adults desired in order to inform development and design. Three focus groups will be conducted.

Thus far, stage 1 has been implemented and results are discussed below.

2.2 Participants

There were 59 participants of which 20 were male and 39 were female. With respect to age, 22% were under 65, 42.4% were 65-75, 25.4% were 75-84 and 10.2% were 85 years of age and over Where n values vary in the below analyses, this is due to missing data. Thirty-one participants were recruited from a supported housing project and 28 from an IT club for older adults.

2.3 Materials

Participants were issued with a postal survey. The purpose was to get an overview of the technologies already in use by older adults and their preferences for the medium through which assistive technology should be provided. Items asked about the frequency with which household technologies are used, confidence with these technologies, and ease of use. Participants were further asked what tasks they completed on a computer, on the internet, on a mobile phone, and on a TV. Finally, participants were asked about the likelihood of their using a variety of assistive technologies as a reminder system for medication.

The following variables were derived:

Often – The frequency with which technologies such as computers, mobile phones and televisions are used. A higher score indicates a higher frequency. The possible range of scores was 5 – 20.

Difficulty – The difficulty with which participants rate using technology such as computers, mobile phones and televisions. A higher score indicates more difficulty. The possible range of scores was 6 – 24.

Confidence – The level of uncertainty the participant experiences when using technology. A higher score indicates more uncertainty; a lower score indicates more confidence. The possible range of scores was 6 – 24.

Participants were also asked about the number of tasks they completed on each of a computer, the internet, a mobile phone, and a TV. Thus four variables were created to describe the number of tasks completed with each.

2.4 Procedure

Questionnaires were distributed and returned via gatekeepers at the housing organisation and the IT club. Informed consent was granted from all participants. Data were entered into SPSS for analysis.

3 RESULTS

3.1 Overview

There are two parts to the data analysis. To begin with the relationships between the variables are

presented. This is followed by comparisons between the age groups surveyed.

3.2 Correlations

The frequency with which participants used technology was significantly correlated with the reported difficulty of use (r =-.561, n= 18, p = .16), and confidence in using technology (r =-.533, n =19, p =.19). Those who use technology more frequently find it easier and have more confidence (see table 1). The easier using technology was perceived, the more confidence participants reported (r =.947, n = 17, p< 001).

Table 1: Correlations between frequency, ease and confidence of use with actual use of technology.

	Often	Difficulty
Difficulty	-.561*	
(n)	(18)	
Confident	-.533*	.947**
(n)	(19)	(17)

Key
* = p<.05
** = p<.01

3.3 Comparisons between Age Groups

Participants were grouped according to their age. Three groups were created; below 65, 65-74, and 75 plus. These groups were contrasted on their frequency of use, difficulty with technology, and confidence with technology, as well as the mean number of tasks completed online. See tables 2 and 3 for means and standard deviations.

Table 2: The mean (sd) frequency, difficulty and confidence with using technology according to age group.

	n	Often	n	Difficulty	n	Confident
Below 65	13	12.92	8	11.75	8	12.13
		(2.33)		(4.53)		(4.85)
65-74	17	14	8	10.38	9	11.22
		(1.80)		(2.07)		(2.44)
75 +	19	10.74	2	13	3	12.33
		(2.70)		(0)		(1.53)
Total	49	12.45	18	11.28	20	11.75
		(2.69)		(3.32)		(3.42)

Of the variables described in tables 2 and 3 significant differences were observed between the age groups regarding frequency of use (F = [2, 46] 9.21, p<.001), the number of functions used on a computer (F = [2, 56] 4.18, p<.05), and the number of functions used on a TV (F = [2, 56] 3.35, p<.05). Specifically, when compared to the 65-74 group, the over 75 group used technology less frequently and

fewer functions on a TV. They also used fewer functions on a computer than the under 65 group.

Table 3: The mean (sd) number of tasks completed with each technology according to age group[†].

	n	Computer	Internet	Mobile	TV
Below 65	13	2	1.08	1.85	2
		(2.24)	(1.49)	(2.03)	(1.47)
65-74	25	1	.52	1.12	1.96
		(1.38)	(1)	(1.48)	(1.27)
75 +	21	.48	.38	.48	.95
		(.98)	(1.07)	(1.36)	(1.63)
Total	59	1.03	.59	1.05	1.61
		(1.58)	(1.16)	(1.63)	(1.51)

† The possible range of scores were as follows; computer use = 0 − 12, internet use = 0 − 8, mobile phone use = 0 − 11, TV use = 0 − 8.

4 DISCUSSION

The present study indicated the frequency and ease of use are related to increased confidence. We therefore need to select a technology that is used frequently, and is easy to use. Of the technologies that were asked about, participants used the most functions on their TV. However, when considering the type of devices that could provide a suitable interface for older adults and mediate the assistive technology, the personal computer (PC) may be perceived as the ideal device. Currently, pre-installed operating environments (Windows, Mac OSX, and Linux) are too complex for untrained users to manage effectively, and as Oksanen-Sarela (Oksanen-Sarela, 2000) observes "(the) more complicated the technology, (the) less it gives space to different ways of using it as the user doesn't have the skills or knowledge (to change its functionality)". Furthermore, it is unlikely that the providers of AT systems will be able to provide the levels of training required by some users, as Dickinson et al (Dickinson et al., 2003) observe, "why should the user be re-educated and redesigned when it is the software that is inappropriate for their needs?"

It was found that that the technological artefacts that were used most often were the mobile phone and television. Given that frequency of use is associated with ease of use and confidence, these technologies have clear potential as applications for the AT. It has already been discussed (Millward & Nicholls, Submitted) that the telephone is not an acceptable medium to present the variety of data that can now be made available. For the proposed intervention, the television was chosen as the mode of delivery as it was the next most familiar. The group of participants with the least familiarity and

most difficulty with the technologies were those over the age of seventy-five. However, confidence levels were roughly equivalent between the three age groups which shows potential for training.

5 CONCLUSIONS

This paper has introduced a new programme of research that seeks to explore the use of assistive technologies (in particular telecare) in evaluating the psychosocial aspects of wellbeing. Barlow et al (2003) discuss that Telecare has been split into two areas – information provision and risk management. This split may be historical in nature, based on the evolution of Telecare systems from community alarm systems (Doughty & Williams, 2004), or it may be based on such systems originating from common requirements agreed between stakeholders from the health and care providers fields (Lines & Hone, 2004). Whatever the reason the result is that systems appear, at least to the end user, to be clinical in nature (Blythe, Monk, & Doughty, 2005). It is argued that it is time that the two facets of Telecare systems come together to form an EEAT system. The benefit of this type of system is that it may make Telecare systems more acceptable to older adults by being more attractive to older adults. This attribute could be stimulated by enhanced usability (this resonates with the definition of social dependability posited by (Blythe et al., 2005), (Dewsbury, Sommerville, Clarke, & Rouncefield, 2003). The specific aspirations of the client group will be assessed in stage 3 of the research plan. Further research will then be directed towards relating these 'future requirements' to the capabilities of the technologies currently available. The contribution of this research to the field is in identifying a potential new application of electronic assistive technology.

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