Internet Services for the underprivileged

Computer courses for the elderly and unemployed at a residents' meeting room

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Abstract. Accessibility means that the use of services should be open to all, to people of all kinds and in all situations. This study in barriers to Internet use for the elderly and unemployed is based on material gathered from persons attending a computer course run by the City Council at a residents' meeting room in Oulu, Northern Finland, through interviews carried out before and after the course and observations made during it. Half of the participants were making e-transactions regularly a year after the course, the most common types being the paying of bills and the sending of e-mails to relatives. It is evident that Web pages provide far too much information at one glance for the elderly to digest, that the basic concepts of the Internet and the metaphorical terms associated with the user interface are by no means obvious, and that the illogicalities of services can easily discourage elderly people from using them. The general accessibility instructions place emphasis on the problems of people with poor eyesight, but surprisingly, none of the people interviewed suffered from the small size of the print on Web pages and nobody complained that their eyesight was a hindrance. Another surprising observation was that using the Internet was mostly regarded as preferable to visiting an office. The elderly people were in their own opinion skilled at using a mouse and at moving rapidly between Web pages, but observations suggested that they had considerable problems with using a mouse and lacked the boldness to move back and forth between pages. The sites that they visited were predominantly Finnish ones. There were also great variations in the degree to which these people felt that they were a part of the information society.

1 Introduction

Business is being conducted with the public authorities more and more often through computer networks, but there are many people, especially among the elderly and unemployed, who have never had any instruction in using a computer either at school or in their work and may experience all kinds of barriers to using the Internet,

for instance, on account of their age or for other reasons. If they wish to learn some of the relevant skills, they have to do so either on their own or through courses.

Residents' meeting rooms are a means by which the local council in a town or city can support residents' associations or other forms of local democracy. At the time when this research was carried out Oulu City Council had ten such rooms that were equipped with computers, and computer courses were held in these from time to time in addition to all the other activities. The majority of people attending these courses were either retired or unemployed and were therefore unable to make use of computers or courses provided by an employer.

Heller et al. [1] report that persons aged 60 years or over mainly use the Internet to find health information, plan journeys or else write e-mails, while Sankari [2] is of the opinion that the elderly find computers handy but challenging tools to work with and are well prepared to manage without them. A computer can nevertheless be useful for maintaining social contacts, pursuing hobbies and avoiding alienation from society. Tuorila and Kytö [3], in their study of the use of the Internet and the negative consequences of the transfer of services to this medium, note, interestingly, that one perceived drawback is the effect on health of the resulting decline in physical exercise, partly as even the moderate amount of exercise involved in looking after one's own affairs in public offices etc. is in danger of being rendered unnecessary. Mäensivu [4] lists the technical barriers experienced by senior citizens as including the complexity of Web sites, their coloured backgrounds and the smallness of the lettering on them. The gaining of access to such pages was also a source of problems. Technical barriers that might be assigned to the category of usability include use of the mouse, especially double clicking, while psychological barriers include uncertainty, fears and poor language skills.

The growth in the proportion of the older age groups among the adult population has given rise to a need for strategies and sets of instructions for achieving better Internet accessibility [5]. Accessibility is closely linked with the issue of usability [6, 7]. Some researchers define accessibility to comprise technical accessibility and usable accessibility [8]. Universal accessibility means accessibility by all, or accessibility by most [9]. The needs of the older age group are often overlooked in matters of information technology [1, 10], although various sets of planning and accessibility instructions have been developed [11-14], also to the blind people [15]. The main question to be addressed in this paper is whether the elderly experience problems in using the Internet, in addition to which some consideration will be given to whether courses held in residents' meeting rooms can offer a solution to the challenges posed by the modern 'information society'.

2 Methods and framework

A background for this work was created by holding meetings in summer 2004 with the Oulu City Council coordinator for local democracy, its project leader for development services, the deputy head of its library services and the provider of

computer support for the IT services department, in order to become acquainted with the activities arranged through the residents' meeting rooms and the situation in the City of Oulu regarding computer transactions. Visits were made to eight meeting rooms and interviews were held with social workers and adults who happened to be there at the time.

The actual gathering of data was based on five computer courses of 24 h each held by one of the authors at the residents' meeting rooms in the Oulu suburb of Puolivälinkangas in spring 2004 and one shorter course in autumn 2004. Personal observations were recorded covering some 100 h during these courses. Participants in the courses were also interviewed at two stages.

The first stage of interviews involved people attending the basic course in 2004, recording the expectations and initial level of knowledge regarding computers of 27 people who had put their names down for this course. All of them were retired on the grounds of either age or incapacity to work, or else they were unemployed. Only one respondent was at work, and she was therefore excluded from the material. One limitation on the findings may be that the people attending a course in a residents' meeting room do not represent a typical cross-section of the retired population. The fact that they had entered for the course suggests that they have an interest in computers, and many of them actually owned one or were thinking of buying one. The participants were divided into five groups of 5–6 persons each. Some of them dropped out during the courses and others attended irregularly.

A second set of interviews, this time by telephone, were conducted a year after the course, for the 12 participants who could be contacted at that stage. The people interviewed were aged 48–74 years (mean 66 years, standard deviation 8 years). The oldest of the original participants, aged 77 years, had dropped out. There were eight women and four men, including two married couples, and their level of education varied from junior school (four persons) to a university degree (two). Three had received a vocational school education, two had attended a commercial college and one had a middle school education. The participants had been retired an average of 10 years (range 0–15 years), two were on a disability pension and one was about to retire on a disability pension but had been partially unemployed for a long time. Five of those interviewed had been quite unaccustomed to using a computer a year earlier, although three had since bought one. By 2005 there were only three people who could be said to be unfamiliar with a computer. These were all women and included two of the participants who had only a junior school education. Two of these people had a computer of their own but had not used it very much. Altogether 11 participants had their own computer, seven had an Internet connection and two of the latter had broadband, while the others were contemplating it. The one person who did not yet own a computer, a widow living on her own who had difficulties with technical devices, reported that she intended to buy a laptop computer and broadband connection in the near future. Conversations with the participants suggested that expense was not a plausible barrier to acquiring a computer for any of them, although the cost of broadband caused them to think for a moment.

The three key dimensions for studying the barriers of internet usage by the underprivileged include psychological, physical and technical barriers (see Figure 1). The psychological barriers comprise learning and attitudes, and the technical barriers comprise issues related to the user interface and the Web usage and transactions.

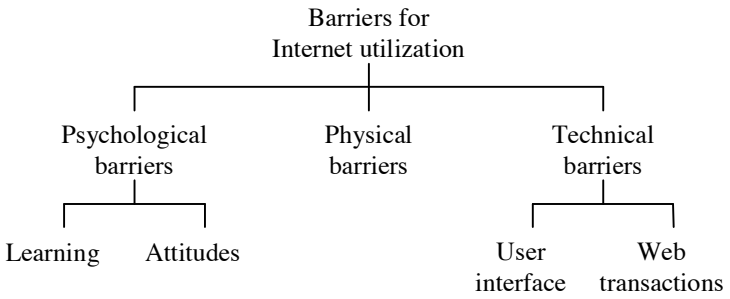

Fig. 1. Barriers for Internet utilization.

3 Results

3.1 Observations

The people taking part in the course had had little or no opportunity to use a computer previously, and most of them were hesitant about it. They were not prepared to do things for themselves and were frightened of jamming the machine. Some of them had a computer at home and were worried about it being ruined by a virus. They had had all kinds of problems with it, including losing the icons for opening programs and being unable to install antivirus programs. They had entered for the course out of interest, and also to some extent in order to pass the time.

Learning. The participants' expectations regarding what they would be able to learn from the course were initially fairly poor, the foremost doubt in their minds being their ability to remember things. Some of them dropped out, which is not unusual for courses that are free of charge (a nominal fee was charged towards the end of the course to cover the cost of coffee and cake during the breaks).

Attitudes. The older participants were well motivated and attended regularly, arriving in good time, and would have been willing to stay for longer. Handouts were distributed and many people made notes on these to help them to practice at home. They were also able to get free advice after the course was over if they came to the meeting room at a certain time. Some would come simply to play patience, while others preferred to ask for advice by e-mail.

Physical barriers. The size of lettering did not seem to present a problem, and when one person asked for the writing to be made larger the result seemed to be less satisfactory, as it caused increased use of the scroll bar.

As there were usually two participants to a computer and they were all very close together, a considerable amount of noise arose, which made it difficult to hear the instructions. One person was in any case hard of hearing and dropped out of the course after a couple of lessons, being unable to follow the teaching. One 77-year-old had poor eyesight and the words on the screen had to be so large that it was necessary to use the scroll bar continuously. This person was incapable of using the

mouse, however, and the instructor had to put her hand on top and move the mouse for her and tell her when to press it. On her own, she would move the mouse in an uncontrolled fashion and press it almost all the time, so that a whole host of windows would appear on the screen. This person similarly dropped out after two lessons. In such cases of highly limited ability one would need a professional teacher for the handicapped or some form of private instruction.

The user interface. There were many *mouse problems*. It was difficult to understand when one had to double-click, when a single click was sufficient and when it was necessary to click the right-hand button. It was also difficult to keep the mouse on the pad, and it would easily stray to the edge of the table, so that it had to be lifted up and moved. It was also hard to click the desired point on the screen, as the mouse would move as it was being clicked, giving the wrong selection and causing confusion. The computer mouse at laptop proved much easier to use, and the participants learned this very well on the one occasion when they tried it.

Web transactions. The first thing to be taught was use of the *e-mail*. Only two participants had an e-mail address, and it was soon realized than one of the drawbacks with providing a free e-mail address is that the pages are apt to be full of advertisements, which clearly disturbed some people, especially since clicking on an advertisement could sometimes cause it to fill the entire screen, so that the user could not escape from the situation. It was almost always difficult to find the fields in which users should enter their own email address and password. A brief illustrated guide to using the e-mail was printed out for each participant, but its use still caused problems for most of them. Their addresses were formed on the "firstname.surname" principle, but they were virtually unable to learn that the letter "ä" had to be written as "a" and "ö" as "o". One participant, a 72-year-old man, never managed to write his address properly at the first attempt and always had to have the instructor beside him to advise. He was not put off by this, however, but took it all very calmly and good-humouredly. Access to this e-mail was hampered by the illogicality that it was not necessary to write the second part of the address, "@operator.fi", on the first page, but if you made a mistake in either the address or the password at that point, you had to write the address on the next screen with the latter part as well. In practice the participants almost always found themselves in this situation, and about half of them tried to write their email address in the URL address field. In the exercises the instructor would carry on an e-mail correspondence with the participants, asking them to reply, but only a small number managed to do so. The sending and receiving of attachment files was an interesting topic but too complicated for beginners.

Some of the group had previously learned to type, so that the use of the keyboard, particularly for *word processing*, did not cause as many problems for them as for the others. Those who had not used either a keyboard or a typewriter before nevertheless wrote slowly and often spent a long time looking for individual keys. The majority managed in the end to produce a whole page to conform to the model document, which gave them great satisfaction.

The greatest amount of time was spent on learning to use the *Internet*. The pages usually had a large amount of material on them, and it seemed that most people began reading them in the manner of a book, from left to right and from top to bottom, being unable initially to glance at a page and extract the essential things from it at once. Similarly they could not muster the courage to move on to new pages

or turn back to previous ones. Surfing for one's own interest and pleasure began to succeed only towards the very end of the course. There were only two men who would set out boldly to find information on the sports pages on their own initiative, and one woman who would surf the pages on dogs; the others would wait for the instructor to guide them. If a page contained more material than would fit on the screen it would be necessary to use a scroll bar, but this would often go unnoticed and its use would sometimes be hampered by deficient mouse skills.

Use of the Google *search* engine did not seem to be of interest as far as finding information was concerned, but the participants were happy to use it to find pictures, which they learned to import into documents of their own.

Use of the Web to conduct *transactions* was also taught, particularly the completion of forms. This was very successful when the tabulator was used to move among the necessary fields. Similarly the participants were able to appreciate that the information would not be passed on until they had approved it. This exercise seemed to reduce their general fear of the Internet.

3.2 Interviews

Learning. Although there had been much talk in the coffee breaks about participants' lack of confidence in their abilities to learn or remember things, the interview material suggests that they had no doubt in the end that they had learned a lot. On the other hand, some people were more worried about the learning abilities of others of the same age. Most of them were of the opinion that everybody should be able to use the Internet and that instruction should be available free of charge.

One 73-year-old woman wrote:

*"**I have learned surprisingly many things** on the course at the Puolivälinkangas meeting room that I had been wary of before. The most interesting things of all were being able to use the public library services via the Internet, to practice paying bills and to learn word processing. I now intend to buy a laptop computer for myself and I will certainly want to use it for bills, for typing, for processing pictures and for ordering air tickets etc. **It will make these things quicker and improve the quality of life.** It might even give me more free time."*

Most of the people interviewed agreed that things had to be repeated many times before they were learned properly, and six of them said that they had taken this course more than once.

People had had all kinds of problems with their own computers in the intervening year: there had been viruses, the computer had "jammed", there had been large amounts of e-mail spam, etc. One interviewee said that use of the Internet had been hampered by the slowness of the modem, and others were of the opinion that it was affected by their own poor skills and various problems with the computer. Nevertheless, all of them said that they had a friend or relative who could help them in technical matters. Three people relied on their grandchildren for this, six on their

children or a son-in-law, and the remaining three on their sister's husband. One person claimed that she had had difficulties after her sons had made "improvements" to her computer.

Attitudes. It could be concluded from the interviews that using a computer had not been a source of anxiety for the participants. In fact very little prejudice against this could be perceived. The youngest respondent (49-year-old woman who had been on a sickness pension for 10 years) had, in her own words, been "in a panic" at the beginning of the course, but now used her computer a lot and reported that her husband had complained that she was "always sitting at that thing". She had bought a computer and subscribed to a broadband connection during the course. She earlier wrote:

"I saw a notice here at the meeting room about a computer course that was starting, and decided to put my name down for it. I thought that in this computer age ***I would need a computer in the future****. I had been interested in learning word processing and in using e-banking and e-mail. It was hard at first, as I had never touched a computer in my life before, but the instructor was so skilful and patient with me that the idea gradually caught on. Now I am quite at home with e-mail and* ***write to my sister in Norway almost every day****. So far I have only practiced with the banking program and I haven't yet paid any real bills. Now I am thinking about a computer of my own."*

There were great variations in how well people felt that they were part of the information society. For example, one person who had not been able to identify with it in 2004 reported being very much involved in it now, in spite of not having used a computer at all since the course ended.

All the respondents expressed great interest in the Internet, except for one woman who had been on the course together with her husband, who was accustomed to using computers to some extent, as they had one of their own, although admittedly without any Internet connection. They had sat together on the course, with the wife using the computer and her husband beside her. The instructor was of the opinion that the wife learned things very well, but she claimed afterwards to have been the worst student of all. She was interested in handicrafts, however, and so was very nimble at using a mouse and a keyboard, and although she was not especially interested in the Internet, she admitted that when visiting her daughter she asks her to find out information from it.

Physical barriers. Although almost all the interviewees wore spectacles (nine had bifocals and two reading glasses) no one regarded eyesight as a problem. Two people mentioned that their neck became tired after using a computer, which may at least in part be connected with vision problems, as the need to look through the lower parts of bifocal lenses forces one to strain the neck upwards. The instructors noticed that this affected most of the people on the course, but they themselves treated it as a natural thing or as only a short-term discomfort, so that it did not prevent them from taking part.

Surprisingly, there was scarcely any comment that the writing on the computer screen was too small. One person even wanted to make it smaller, and only one tried to enlarge it. Although there are means for making the written parts of displays

clearer, e.g. by altering the font, removing background pictures, etc. the participants' skills were not up to this, and only two reported having changed the font size themselves.

The people who found the writing too small were among the oldest participants. One was suffering from the beginnings of cataract and another from retinal degeneration, but the third had no ophthalmological disease. One of these people had enlarged the print, but had also suffered from time to time from the mouse cursor "disappearing" from the screen. Altogether there were five people with an ophthalmological condition (cataract, retinal degeneration or glaucoma) but this had evidently been fairly well correctable with spectacles. One person complained that his bifocals were a nuisance as they meant having to stretch the neck upwards to see the screen [cf. 16]. He had tried to rearrange the positions of the chair and table and had asked an optician about reading glasses, but was of the opinion that they were too expensive for computer use alone.

The user interface. The average participant would seem from the interviews to have liked using a computer in spite of not finding it at all easy. Sending and receiving e-mails and surfing the Web had been fun and both a mouse and a keyboard were regarded as easy to use. Similarly it was felt to be easy to read things on the screen. The elderly participants had nevertheless failed to notice certain things that had been apparent to the instructor, e.g. the fact that the majority of people had difficulties in using the mouse, whereas only one person mentioned this as a problem.

One 69-year-old woman reported:

"Now that I have started this computer course it seems that ***I am having trouble with using the mouse****. I don't always manage to point it at the right spot, and I can't always "pull" it as the instructor asks. The keyboard is rather awkward in its box, but that isn't too much of a problem on a short course like this. Many new things have come up, and I hope I will remember them on the next course.* ***There are also lots of tiny details to learn*** *that are easily forgotten if you don't use them regularly. I don't have a computer of my own, so my computer use is restricted to this course. Technical things are not my strong point, but fortunately the teacher was usually on hand to help. Time passes quickly when you try to learn new things, and you have to be careful not to delete the whole of your work by accident with only a tiny click of the mouse. There are lots of "finer points" that it would be nice to learn to use. – – Two hours at a time is suitable enough for learning something new, but as the lessons are just once a week, you easily forget some of the things you learned the last time.* ***I hope I will learn enough from this to manage with the digital TV when it comes in****."*

There was great uncertainty about surfing the Web. As many as 10 of the interviewees regarded the whole Internet as highly or mildly confusing, and it emerged from conversations that the Web pages were too full of detail, so that it was difficult to find what one was looking for. More than half of the respondents were disturbed by animations, while some said straightforwardly that they paid no

attention to either these or advertisements. Opinions of the degree to which they understood what they found on the Internet were variable: almost all the respondents said that they had found themselves on English Web pages by accident, but only two had even a moderate command of that language.

Although the first enquiry had suggested that no one had any trouble with using a mouse and that only the right-hand mouse button and the double-clicking technique caused difficulties, the instructors observed that there were far more problems. These were evidently only realised in personal conversations. Even so, eight respondents to the later enquiry still denied that it was difficult to aim the mouse at a particular spot, in spite of the fact that five of them had some defect in the hand with which they operated the mouse, including three with a very serious disability.

Web transactions. Surprisingly, it was agreed that in principle transactions carried out on the Web were preferable to visiting offices personally (nine people were either entirely or partly of this opinion), although the one advantage with the latter, it was claimed, was that it gave one exercise. Five people were now in the habit of paying their bills by computer and three hoped to be able to do so in the future. Some used their bank's payment service, some the bank's own automatic system and some went to the office in person. No one claimed to visit a bank to pay their bills. One person used the computers in the residents' meeting room or in the public library for this purpose. Three respondents had ordered tickets via the Internet, either alone or with help, and two of them had also bought goods that way and the third on one occasion. All of the interviewees were very cautious, and even fearful, when it came to financial matters, however. This was not a fear of doing something irreversibly wrong, however, as the people claimed to be quite bold in their surfing of the Internet. Only four of them had a password for the public library's Internet pages, however.

Although the Internet was felt to be an interesting thing and many people said that they regretted having used a computer so little, they were nevertheless of the opinion that they could easily manage without the Internet. They all led busy lives and were involved in many other activities. Three claimed to make extensive use of the Internet. One claimed to be addicted to Chat. The most important uses of the Internet were said to be: banking (six respondents), e-mail (three), timetables (one) and chatting (one). It is often assumed that elderly people look for health information on the Internet [cf. 1], and Becker [17] points out that special attention should be paid to the accessibility of health information and services, but only four of the people interviewed here had been interested in this aspect, whereas four had used it to look for food recipes as well. Altogether 11 people maintained that they had derived some benefit from using the Internet, while one person saw no benefit in it but was nevertheless applying for a broadband connection. Like most of the respondents, he had made little use of it since the end of the course, but said that he had used it with his sons to find sports results and spent about one hour a week on the net.

Overall, the respondents reported spending 0-10 hours a week on the Internet, with an average of 2 hours. Three had not used it at all since the end of the course. Seven made use of e-mail, even though the whole group had been taught how to use it and provided with addresses. It may be that the e-mail service concerned was

sufficiently difficult to work with that it had not inspired people to continue using e-mail.

4 Conclusions

It can be concluded from the above that a half of the participants were regularly conducting Web transactions a year after the course had ended, the main functions being the paying of bills and the sending of e-mails to relatives. The advantages of both are clearly and rapidly to be appreciated. All in all, these elderly people wanted to learn new things and were eager to make plans regarding the future.

The interview results suggest that these people were in no doubt about their ability to learn new things when they came to the course but were more uncertain whether they would be able to remember things. They did not in general regard either a computer or the Internet as a source of anxiety as such, but simply the technical aspects involved in these, e.g. in the installation and updating of programs, or in virus problems and their control. In practice every one of the participants had a relative or friend who could help in these technical matters. The fear surrounding the use of the Internet also seemed to be reduced by experiences of using it successfully, e.g. upon discovering that the data in e-transactions will be sent on to the recipient only when the sender has approved them.

It is clear that Web pages all too often contain far too much information at one glance for an elderly person to cope with, and scanning through it to extract what is essential will not necessarily work, even though the familiar newspaper metaphor may be understood well enough. Many people are distracted by animations and advertisements, and many common concepts connected with computers and the Internet that are familiar to most people, such as www addresses, e-mail attachment files, fields for passwords and the like, are not necessarily intuitively obvious. The same is true of many user interface metaphors, such as the moving and double-clicking of a mouse, the keyboard and scroll bars on the screen. Illogicalities in Web sites, e.g. in navigation possibilities, can also easily throw elderly people into despair to the extent of ceasing to use the service in question. At the same time their skills are not usually up to such tasks as altering browser settings (e.g. to obtain a larger font or eliminate background pictures).

Rather surprisingly, the interviewees did not feel that they had suffered on account of the smallness of the print on Web pages, nor did anyone regard their eyesight as detracting from computer use. This is an interesting observation, since the instructions for ensuring the usability of computer systems place especial emphasis on problems of vision. One may ask whether the instructions need to be revised or whether it is that elderly people are not prepared to demand better facilities in computers. Another surprising finding was that e-transactions were regarded as preferable to visiting offices in person.

Certain contradictions arose between the observations and the facts reported by the elderly people themselves. They may well have imagined that they were skilled

at using a mouse or at browsing through the Web, but observations suggested that the mouse caused considerable problems and that they were not bold enough to surf the Internet and return to where they had started. This situation only altered after a considerable length of time. Similarly, they would not admit to a fear of doing something that was irreversibly wrong, although observations suggested that this was frequently the case. It is quite natural, of course, not to perceive difficulties like this oneself even though they may be apparent to others.

The Web pages that these people visited were mostly Finnish ones, and it must be admitted that a poor command of English is a considerable barrier to operating on the Web. Altogether, there were great variations in the extent to which people felt that they were part of the information society. For example, one interviewee who had claimed to be poorly integrated into the information society at the beginning of the course had a feeling of being part of it in the interview a year later in spite of not having used a computer at all in the meantime. All told, these elderly people did not appear to attach as much importance to the Internet as is generally assumed in information society strategies.

Computers installed in residents' meeting rooms can provide pensioners and others with an easy introduction to computing. The threshold is lowered by the fact that the meeting room is close at hand and the atmosphere there familiar and homely. Courses are arranged nowadays in most meeting rooms of this kind in Finnish towns and cities, and continuous help and advice is available. Most people need more than one course, however, just to rid themselves of their unfounded fears and gather the necessary basic information. Most of the present respondents had had more than one course and said that they still needed more.

It would be interesting to further study how much use the elderly and unemployed really make of Internet services, and what is the impact of different information system functionalities (e.g. sitemaps and navigation routes) on their accessibility. There are estimations that as many as 30% of elderly people need computer services to be more accessible than at present [18], but it remains to be seen whether the provision of such services that meet the accessibility requirements actually increases their use by elderly people.

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