Digital Information Access for Ageing Persons

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***Abstract*— Competences related to the use of digital and mobile technologies are of key importance as connected mobile devices such as smartphones or tablets become more and more pervasive and ubiquitous. In a moment where socio-demographic changes resulted in a rapidly growing number of senior citizens, it is fundamental to provide this target group with the necessary skills to be connected and integrated in this world preventing an age-related digital divide. As a contribution to that effort, a European-wide digital literacy development initiative for senior citizens was setup. This article presents the analysis of the achieved results which reflects a very positive perception of the seniors on the developed digital abilities.**

Keywords- Ageing, Lifelong learning, Knowledge society, Senior Education, Mobile technology

I. INTRODUCTION

In the Digital Knowledge Society, access to information and communication has to be ensured for all including naturally the ageing population. Older persons should enjoy a high quality of life, connected to the ability to maintain an active and healthy life, with autonomy and independence, wealth and social relations [1, 2]. These aspects correspond to the areas pointed out in the Action Plan on Ageing Well in the Information Society [3]:

- "Ageing well at work, by staying active and productive for longer;
- Ageing well in the community, as staying socially active and creative, reducing social isolation;
- Ageing well at home, as enjoying a healthier and higher quality of daily life, assisted by technology, with a high degree of independence, autonomy and dignity."

Digital technologies certainly play a crucial role for the personal and social development but their emergence created new social inequalities:

- "Exclusion from information or knowledge-based society on the basis of age, gender, origin or socio-economic status represents a new form of social exclusion, the so-called digital divide" [4, 5].
- "The engagement with ICTs is unequally distributed across society leading to a digital divide" [6].

Senior citizens are often info-excluded and there is a much larger proportion of seniors not using digital devices when compared to the general population [7, 8]. However, in most studied cases, the key to technology adoption turned out to be access, information, training and the availability of useful applications.

UISEL (Ubiquitous Information for Senior Citizens Learning) was a European initiative focusing on leveraging processes of independency and individual empowerment of Senior Citizens through the use of mobile devices. The initiative was focused on developing practical knowledge and skills related to the use of the mobile devices for information access, taxes and fiscal obligations, social security issues, emergency situations, and, not less important, for leisure, social relations and communication.

II. SENIOR CITIZENS AND MOBILE TECHNOLOGIES

In the scope of UISEL, a preliminary study was conducted with 31 experts in senior learning from seven European countries (Austria, Portugal, Spain, Slovakia, Czech Republic, Italy and Romania) to assess and characterize the senior citizens' needs and how they could be satisfied through digital mobile technologies. A semi-structured interview process was setup based on Wittpoth's determination of the influence of gender, age (generation), educational attainment, social status and former occupational position in the participation in senior education [9].

In general, experts agreed that the use of mobile devices would greatly benefit the senior citizens as some of the difficulties faced in everyday life could be better addressed. Among the advantages, they considered that mobile devices could help reduce isolation and social exclusion and they were very useful in emergencies. Experts mentioned that almost all seniors already used mobile phones for general communication purposes but only a few of them would go beyond that and use smartphones for chat and messaging. Some seniors also used desktop or laptop computers as a communication tool with relatives or friends and as an access point to Internet. The use of tablets and smartphones by seniors to access the internet and its services was still residual and depended on the socio-economic context [10].

Most experts shared the opinion that the motivation to use digital mobile devices depended highly on the level of education and professional experience the seniors had during their life. Focusing on the age factor, experts indicated the following typical patterns of use:

- 60 to 70 years old: used cell phones and a few used smartphones; to less extent they used tablets; the use of laptops and e-book readers was relatively widespread among those still professionally active;
- 71 to 80 years old: used the basic functions of cell phones and mainly in cases of emergency; some used laptops.

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- +80 years old: only a small number used cell phones; use of laptops was very rare.

Experts also acknowledged the relevance of tablet use for seniors considering that the main difficulties by older learners were connected with age related physical limitations, namely sight, manual coordination and dexterity. Tablets were easier to handle, and they required less technical knowledge compared with standard PCs. However, several potential challenges in the use of tablets by seniors were also mentioned:

- The apps user interfaces on tablets were not as intuitive for older persons as the ones in PC apps;
- There were several basic UI principles that differ significantly in PCs and laptops and that the user needed to understand, like the use of touchscreens;
- Online safety and data security were important issues for seniors and this was especially relevant for tablet users, since most tablets required an e-mail account;
- The screen size of standard tablets might still be a problem for the target group. Generally, bigger tablets are recommended.

III. UISEL: UBIQUITOUS INFORMATION FOR SENIOR CITIZENS' LEARNING

UISEL intended to achieve practical learning on how to better exploit mobile digital technologies considering that the senior's active involvement with technology contributes to the improvement of their health and quality of life [11-13]. Senior citizens could benefit, for instance, from access to lower-cost goods and services available online [14]. UISEL's aim was achieved through the definition, development and implementation of a two-stage methodology:

1. A training phase for trainers and caretakers that were in direct contact with senior citizens. It took place through a blended learning methodology integrating face-to-face sessions and mobile multimedia contents with the support of an e-platform for collaboration and communication;
2. The transfer of the mobile technology appropriation to the senior citizens. This was achieved through direct training by the trainers and caretakers with the support of mobile multimedia modules that also had a self-learning model so that senior citizens could recall how to use any of the mobile devices functionalities.

The following modules were developed: Introduction to the use of mobile devices; E-government; E-banking; E-health; E-interaction; E-information and media.

The pedagogical methodology was also supported by a mobile app that allowed direct access to the contents and a serious game that allowed developing skills and competences related to the handling of mobile devices.

A. Implementation

The seniors' training phase was implemented during a 6-month period in all seven countries. It counted with the active participation of 233 senior citizens and 27 trainers/caretakers. In total 25 actions with different groups of seniors were organized, in 15 different locations and involving 18 organizations.

The model was implemented through a combination of f2f sessions animated by trainers, followed by autonomous work. The e-learning component consisted in accessing the provided UISEL app, going through the tutorial videos proposed and performing the suggested e-activities. The pedagogical methodology included an evaluation component aimed at improving the contents and methodology by collecting data through these tools:

- Applying an initial survey to all the seniors;
- Observing and informally registering the implementation of the methodology;
- Applying a final survey to all seniors at the end of the course to measure the level of satisfaction;
- Applying an evaluation survey to the trainers at the end of the training and performing a semi-structured interview with some of them.

B. Results

The initial survey was answered by 233 senior participants. 45% of the participants were aged between 65 and 75 years old. 30% of the participants, was aged between 55 and 65 years old. 20% were in the range of 75 - 85 years old, and 4% were more than 85 years old.

The majority of participants were women (73%) although with different weights per country: in ES men represented 45% and in PT 38% of the participants, while AT, CZ and IT had only 12%, 16% and 19% men participants, respectively.

About 40% of seniors had completed the high school level, 30% had a university/college degree and 25% completed the secondary school. 5% had solely completed the primary school level and 1% had even less than that. Concerning pre-existing health and physical issues, only about 35% of the participants (80 out of 233) marked at least one box in this question and the great majority (82%) of these mentioned eyesight issues. 9% declared having difficulty in holding their hands steady, while 8% stated having trouble with picking up small things with their fingers. However, it was noticed by some trainers that a great majority did not answer because they perceived this question as being too personal.

Participants were asked to identify the ICT devices used on a regular basis, i.e., at least once a week. The most used device was the mobile phone (46% of the total number of ticks), followed by laptops and PCs with 22% and 21%, respectively. Tablets represented 12%. 38% of the senior citizens used regularly two devices, 27% used only one device, and 35% used three or more devices.

In the final survey, participants were asked to provide their perception on the interest and relevance of the UISEL approach. In Romania, the most successful topics were Internet access and skype communication in the e-interaction/e-communication module. Another module of interest was e-health. In Portugal, the introductory module was quite successful with the how to search, install and uninstall apps being one of the most appreciated topics. In the e-communication module the use of email, Facebook and Skype was appreciated. The e-health module and the e-

banking were successful as well. In the Czech Republic, seniors were very much interested in the e-interaction / e-communication module and in the e-entertainment / media module. Also positively evaluated was the e-government module, namely the consumer protection and financial distress issues, as well as information about retirement and other social benefits. In Austria all topics seemed to be relevant for the target group, except the e-government module. In Italy the e-health module was very appreciated by the seniors. Other topics they liked include Skype and Gmail. In Slovakia, the most appreciated module was e-entertainment, with YouTube, browsing through e-magazines and e-articles being the favorite activities. In Spain, the most interesting modules were the introductory one and the e-entertainment/e-media. The feedback on the UISEL app and game was especially positive. The game was a good instrument to learn first steps on the tablets and was used by all participants during class. In Italy, the UISEL game was considered to be very intuitive and useful for learning touch movement and gain dexterity. Also in Czech Republic the game was considered the most successful resource - being fun for the participants and helping them to feel comfortable with this new technology by understanding the right moves and the way tablets react.

The UISEL pedagogical approach was considered appropriate. The combination of learning in class and group repetition was something already practiced generally in senior classes. The availability of learning materials in digital format to support autonomous learning was appreciated by the seniors as they had the opportunity to practice on their own. But in some cases, the autonomous component was very hard for participants and they did not show particular interest in using the tablets at home.

Providing seniors some spare time after or before the class seemed to be more effective and appreciated by them. During the e-learning activities it was important to give trainees the time to repeat the procedure learned in class in an independent way. In the Spanish group, the availability of learning materials in digital format was quite appreciated by the seniors. The main suggested improvements were:

- Duration and content of the introductory module: A few cycles of learning and repetition were required for seniors to feel autonomous and secure about tablet usage;
- Length of the course and the sessions: The whole course duration should be extended to allow for deepening of concepts between sessions;
- Reinforcing online security issues: Seniors are a particularly vulnerable group, and emphasis should be placed on the fact that they shouldn't provide personal information in the virtual environment.

IV. CONCLUSIONS

Socio-demographic changes have resulted in a rapidly growing number of elderly persons. The need to fully integrate these citizens in the Knowledge Society is a societal priority to prevent an age-related digital divide. The use of mobile devices greatly benefits the seniors as some of the difficulties faced in their everyday life could be better addressed.

The UISEL initiative was meant to provide senior citizens throughout Europe with the necessary skills and abilities to use digital mobile devices so that they could be part of the Digital Society. The training courses, the provided resources and contents and the overall methodology were much appreciated both by senior citizens and trainers. Feedback was highly positive in all aspects. The least positive item related to the duration of the course which has been deemed as too short.

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